5/S

San Francisco Public Library

GOVERNMENT INFORMATION CENTER
SAN FRANCISCO PUBLIC LIBRARY

REFERENCE BOOK

Not to be taken from the Library

FEB 27 2002

Digitized by the Internet Archive
in 2016 with funding from
San Francisco Public Library

https://archive.org/details/alamedawatershed1998sanf

SAN FRANCISCO PUBLIC LIBRARY
3 1223 05612 5926

Alameda Watershed Management Plan

APPENDIX A
VOLUME I

San Francisco Public Utilities Commission

November 1998

List of Appendices

The following documents and memoranda were prepared during the course of the watershed management planning process. This information was gathered at specific points in time during the planning process and does not necessarily represent the information contained in the Alameda Watershed Management Plan. Some specific issues noted in the following appendices may have been refined through the planning process. These refinements are reflected in the Alameda Watershed Management Plan.

The items shaded in the List of Appendices below are bound together in this volume.

Appendix A. Alameda Watershed: Managment Plan Elements and Miscellaneous Material[1]

Volume I

A-1 Alameda Watershed Fire Management Element, August 1996

A-2 Alameda Creek Watershed Grazing Resources Management Plan, July 1997

A-3 Sunol Valley Resources Management Element, November 1998

contents of this volume

Volume II

A-4 Alameda Watershed Natural and Cultural Resources, June 1994

A-5 Alameda Creek Water Resources Study, January 1995

Volume III

A-6 Alameda Creek Water Resources Study Appendices A-1, January 1995

Appendix B. Alameda Watershed: Map Digest[1]

Slope
Aspect
Vegetation Communities
Landslide Susceptibility and Faults
Leased Lands
Sensitive Vegetation Communities
Sensitive Wildlife Habitats and Species
Soil Sensitivity
Composite Water Quality Vulnerability Zones
Composite Ecological Sensitivity Zones
Known Cultural Resources and Potential Sensitivity Zones
Wildlife Severity
Erosion and Land Instability
Composite High Sensitivity Zones

4 47608 SFPL: ECONO JRS
21 SFPL 02/15/02 46

3 1223 05612 5926

Appendix C. Peninsula and Alameda Watershed: Surveys and Technical Memoranda[2]

Volume I

C-1 Watershed Sanitary Survey for the Alameda and Peninsula Watersheds, October 1995

Volume II

C-2 Technical Memorandum #1: San Francisco Water System Facilities and Practices, April 1993
C-3 Technical Memorandum #2: Water Quality Vulnerability Zone Development, March 1994
C-4 Technical Memorandum #3: Sediment Yields of Alameda and Peninsula Watersheds, September 1994
C-5 Technical Memorandum #4: Visual Resources, November 1996
C-6 Technical Memorandum #5: Best Management Practices (to be completed)
C-7 Technical Memorandum #6: Economic Profile of Watershed Land Management by the San Francisco Water Department, November 1993
C-8 Technical Memorandum #7: Demographic Profile of Areas Adjacent to Peninsula and Alameda Watershed Lands, November 1993
C-9 Technical Memorandum #8: General Plans Review, June 1994
C-10 Technical Memorandum #9: Utilities and Infrastructure Review, June 1994
C-11 Technical Memorandum #10: Regional Recreational Facility Inventory, June 1994
C-12 Technical Memorandum #11: SFPUC Policies, September 1993

Appendix D. Peninsula and Alameda Watersheds: Planning Process and Public Participation Reports and Materials[2]

Volume I

D-1 Public Opinion Survey Report, February 1994
D-2 Technical Memorandum #12: Watershed Management Planning Process, September 1996
D-3 Agency Interview Summaries, February 1994

Public, Agency and Staff Workshop Summaries[3]

Volume II

D-4 Workshop Summary Report #1, May 1993
D-5 Agency Workshop Report 31, July 1993
D-6 Agency Workshop Report #2, January 1994

Volume III

D-7 SFWD Staff Workshop Report #1, February 1994
D-8 Public Workshop Report #2, April 1994
D-9 Public Workshops and Joint Agency Workshop #4, June 1994
D-10 Summary of SFPUC Hearings on the San Francisco Watershed Management Plans, January 1995
D-11 Summary of Public Involvement and Agency Coordination Activities, August 1992 - June 1996
D-12 Presentation Boards

Newsletters and Brochures

D-13 Watershed Watch Newletters
  Volume 1, February 1993
  Volume 2, May 1993
  Volume 3, Fall 1993
  Volume 4, Spring 1995
  Volume 5, Winter 1995
  Volume 6, Fall 1996
  Volume 7, Summer 1997 (to be completed)
  Volume 8, Fall 1997 (to be completed)
D-14 Brochures
  Coordinated Water Management: An Orientation to the Water System of the City and County of San Francisco

[1] *Material in this Appendix has been prepared exclusively for the Alameda Watershed.*

[2] *Material in this Appendix covers both the Peninsula and Alameda Watersheds, and therefore it is a common Appendix to both the Peninsula Watershed Management Plan and the Alameda Watershed Management Plan.*

[3] *The Sunol Valley Resources Management Element Draft Public Involvement Summary Report (August 1995) is included in the Sunol Valley Resources Management Element, Appendix A-3.*

Appendix A-1

Alameda Watershed
Fire Management Element
August 1996

DRAFT

FIRE MANAGEMENT PLAN ALAMEDA WATERSHED

prepared for the
San Francisco Water Department
under contract to EDAW
by
Wildland Resource Management

August 29, 1996

Table of Contents

pg

I. INTRODUCTION

A. BACKGROUND
1. Purpose and Scope of Plan 1
2. Planning History 1
   Past Plans
   Current Planning
3. Fire Suppression Policies 2
4. Existing Fuel Management Policy 2

B. SETTING
1. Fuels 2
2. Weather 3
   Background
   Local Weather Conditions
3. Topography 5
   Role Of Topography In Fire Behavior
   Description of Local Topography
4. Values at Risk 7
5. Jurisdiction 8
6. Neighborhood Context 8

C. HISTORY OF DISTURBANCE 8
1. Fire History 9
2. Storm-Caused Damage 10
3. Disturbance Through Mass Wasting and Erosion 10

II. ANALYSIS

A. HAZARD RATING 12
1. Methodology 12
   California Wildfire Severity Law AB337
   BEHAVE
   FARSITE
2. Analysis Results 14
   Spatial Distribution of AB337 Hazard Rating on the Alameda Watershed
   Analysis of Potential Fire Behavior Using BEHAVE
   Analysis of Fire Spread Potential Using FARSITE

III. FIRE DEFENSE IMPROVEMENT PLAN 17

A. CURRENT CONDITION 17
1. Current Access 17
2. Standards for Roads 18

3. Current Water Supply 18
Hydrants
Reservoirs and Ponds
Water Tanks
4. Special Concerns/Hazards 19
5. Modified Suppression Areas 20
6. Equipment Available 20
SFWD Equipment
CDF Equipment
Mutual Aid Availability
B. PROJECT LIST TO ENHANCE SUPPRESSION 21
1. Water Supply 21
Dry Hydrants
Heliports
Hydrants
Water Tanks
2. Access 22

IV. FUEL MANAGEMENT PLAN

A. OBJECTIVES, PRIORITIES AND STRATEGIES 23
1. Fuel Management Objectives 23
2. Priorities 23
3. Stategies In Areas Of Fuel Management 24
B. FUEL MANAGEMENT STANDARDS 24
1. Prescription for Grasslands 25
2. Prescription for North Coastal Scrub 25
3. Prescription for Successional Scrub 26
4. Prescription for Chaparral 26
5. Prescription for Eucalyptus Forest 27
6. Prescription for Mixed Evergreen Forests and Oak Woodlands 27
7. Prescription for Riparian Forest 27
8. Defensible Space Guidelines 27
C. DESCRIPTION OF METHODS AVAILABLE 29
1. Hand Labor 29
2. Tree Removal 31
3. Mechanical Treatments 33
4. Prescribed Burning 35
5. Grazing 37
6. Chemical Treatments 39
D. PROJECT LIST
1. History of Fuel Management 41
E. FIRE PREVENTION MEASURES DURING PROJECT IMPLEMENTATION AND MAINTENANCE 41
F. PROJECT DESCRIPTION 41
1. Projects- Overview 41
2. Specific Projects List 42
3. Organization 42
4. Alameda Watershed Fuel Management Projects 43
Project 1 - Niles Canyon

Project 2 - Calaveras Creek
Project 3 - Poverty Ridge
Project 4 - Williams Gulch
Project 5 - Alameda Creek
Project 6 - Below Sheridan Rd.
Project 7. Prescribed Burns Above Calaveras Rd.
Project 8 - Exclusion Burns
Project 9 - Roadside Disking
Project 10 - Clearance Around Structures
Project 11 - Grazing Leases
Project 12 - Powerline Clearing
Project 13 - Tree Fall Removal

V. FIRE RESPONSE PLAN

A. FIRE RESPONSE 49
B. DETECTION AND REPORTING 49
C. INITIAL ATTACK 49
D. EVACUATION PROCEDURE 50
E. SOURCES OF MAPS TO PROVIDE INCIDENT COMMANDER 50
F. TRAINING REQUIREMENTS 51

VI. WORK PLAN

A. PRIORITIZATION OF PROJECTS 53
B. SCHEDULING OF PROJECTS 53

VII. MONITORING PLAN 54

VIII.COSTS OF FUEL MANAGEMENT TECHNIQUES

A. COSTS PER FUEL MANAGEMENT TECHNIQUE 55
B. COSTS FOR FIRE DEFENSE IMPROVEMENTS
1. Road Improvemens 57
2. Water Improvements 57
3.Additional Equipment Needed 57
C. PROJECTION OF COSTS FOR COMING 5-10 YR HORIZON 58
D. YEARLY FUEL MANAGEMENT COSTS 58

IX. EXPANDED POLICIES 59

X. BIBLIOGRAPHY 78

EXECUTIVE SUMMARY

- The plan describes the setting in terms of topography, weather, values at risk, fire protection juristiction and neighboring land owership patterns and uses
- The plan establishes site-wide standards for post treatment conditions, based on standards agreed upon by a multi-agency consortium (The East Bay Hills Vegetation Management Consortium)
- Establishes fuel conditions throughout the watershed through:
    - hazard analysis using the method of AB337
    - hazard analysis using fire behavior prediction and potential fire growth
- Describes on-site fire defense improvements (water supply, access)
- Proposes a set of fuel management projects to reduce fuel hazards
- Proposes a set of fire defense improvement to facilitate fire suppression
- Suggests a schedule of implementation
- Estimates costs of implementation which includes equipment purchase, contracting costs, and operating costs
- Describes a monitoring program
- Proposes a set of policies which will aid implmentation of projected projects and improve fire safety as well as resource management

ALAMEDA WATERSHED
FIRE MANAGEMENT PLAN

I. INTRODUCTION

A. BACKGROUND

1. Purpose and Scope of Plan

A 1994 management audit by the Mayor's Office of the City and County of San Francisco recommended that a wildland fire protection plan be prepared for the San Francisco Water Department Watershed lands for approval by the Public Utility Commission. This was subsequent to a similar recommendation made by the City and County of San Francisco Grand Jury in 1992. This Fire Management Plan is intended to address this requirement, as well as to assist the watershed management staff and local fire departments (California Department of Forestry and Fire Protection - CDF) in their fire planning.

This plan reviews exiting conditions, and suggests proposed projects, in order to: minimize damage and liability from wildfire to the natural environment, and to structures/improvements on site, and potential for fire to spread off the watershed boundaries and damaging the property of others. This plan is intended to ensure that proper maintenance will be carried out in perpetuity on the watersheds to ensure proper levels of fire safety. Another goal of the plan is to make recommendations towards the establishment of a fuel management program where fire safety is compatible with environmental stewardship.

2. Planning History

Past Plans - No previous fire management plan has been prepared for the Alameda Watershed.

Current Planning - Current planning is dominated by the development of a Watershed Resource Management Plan, which has the following mission:

"To provide the best environment for the production, collection and storage of the highest quality water for the City and County of San Francisco and suburban users by developing, implementing and monitoring a resource management program which addresses all watershed land use activities and implements best management practices for the protection of water and natural resources and their conservation, enhancement, restoration, and maintenance while balancing financial costs and benefits."

The Watershed Management Plan may influence the public access for recreation and potential number of ignitions. Several issues were raised in public meetings that directly address fire management. These include increased access, alternatives to fire breaks, and prescribed burning for fire hazard reduction.

Several plans are being developed as part of this master plan including a Sanitary Survey and Grazing Plan. The contents of the Sanitary Survey may have little application for fire management except as modification of grazing may change fire hazard levels or costs for alternative treatments. The Grazing Plan is not expected to change the extent or location of proposed fuel management projects but may slightly alter yearly treatments so as to conform with minimum residual dry matter levels or to slightly change the timing of treatments.

As with all resource management plans, aspects of each discipline apply to others. For fire management, recommendations regarding geology and soils may modify fuel management

projects to minimize sedimentation through surface erosion or landslides. Similarly, road improvements for fire access will need to consider recommendations regarding the soil resource. Concerns for cultural resource preservation may require additional surveys prior to implementation of projects and modification of projects to avoid or otherwise protect any cultural heritage found.

Because vegetation management forms the basis of fuel management projects, this discipline is highly related to fire management. Similarly, the type and structure of vegetation forms a vital component of wildlife habitat. Concerns for species distribution and effects of treatments (as well as of a wildfire with no action) will influence the timing, location, and extent of proposed fuel management projects.

In turn fire management concerns impact other disciplines. For example, minimization of ignitions may limit access or influence routing of trails. Protection of resources (and desire to increase biodiversity) may suggest fuel management projects and fire defense improvements.

3. Current Fire Suppression Policies

All fires are to be suppressed as soon as possible. This policy is chosen from three wildland fire suppression options which include: (1) "herding" the fire where resource damage is negligible, or (2) immediate and complete suppression, or (3) simply containing the fire. No wildfires are allowed to burn, regardless of fire behavior or suppression costs. Suppression of all fires will recognize safety and liability priorities as follows:
(a) protection of human life and property;
(b) protection of watershed and natural values
(c) protection of adjacent private property;

In order to implement the fire suppression policy, all fires are extinguished as soon as possible. No specific direction is provided regarding the means of suppression beyond standard operating procedures followed by the fire suppression agency.

4. Existing Fuel Management Policy

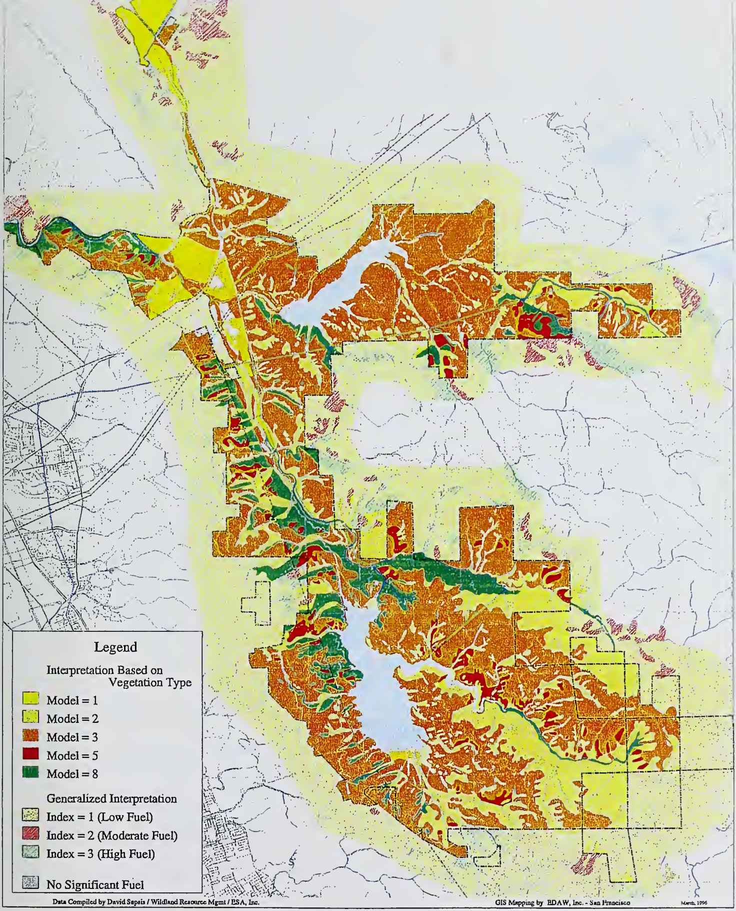
The current practices regarding fuel management does not prohibit vegetation management for fire hazard reduction. In fact, the use of Sheriff Inamte Crews and purchase of the Unimog and attachments has been supported by the current fuel management practices.

One policy which is, in part, based on concerns regarding potential watershed damage from fire is the strict control of access onto the watershed.

B. SETTING

1. Fuels

To a fire, all vegetation is a fuel. Fuel models describe such vegetation as tall or short chaparral, tall or short grass, or oak woodlands with or without an understory. Fire managers use fuel models, numbered by the ten Northern Fire Laboratory (now the Intermountain Fire Sceinces Laboratory). Fuel models are called NFFL #1, 3, 4, 5, 8,or 9. Slightly over 50% of the Alameda watershed is covered with grassy fuels. Currently 3.7% is categorized as short grass (NFFL #1) and 49% is tall grass (NFFL#3). The grass was categorized as potential fuel, and assumed to be ungrazed. Since most of the area is grazed, a larger proportion of the watershed is actually



Data Compiled by David Sapsis / Wildland Resource Mgmt / ESA, Inc.

GIS Mapping by EDAW, Inc. - San Francisco

March, 1996

Fuel Classification (CHECKPLOT)

ALAMEDA WATERSHED

SAN FRANCISCO WATERSHED MANAGEMENT PLANS

Scale 1 : 80,000

1" = 6667 feet

short grass throughout most the year. In the canyons grasslands are intermixed with other fuel types.

Twenty-two percent is categorized as grass which has a moderate cover of oaks (NFFL #2). This fuel type is particularly found east of Calaveras Lake and south of Arroyo Hondo. This fuel type intergrades with denser hardwood forests of oak, bay and madrone where fire behavior is fairly benign.

The grass also intergrades with shrubs, which presents more dangerous fire behavior. Only 1450 acres (2.5%) are categorized as a shrub fuel type (NFFL #5), which intergrades with grass and true chaparral. Small, isolated areas (totaling 300 acres) of chaparral (NFFL #4) are scattered throughout the watershed, more often found in Poverty Ridge, Upper San Antonio Creek, in scattered stands. This fuel type is not mapped as discrete polygons.

Canyon areas, especially on northern aspects comprising 3679 acres or 9.4%, are covered by closed canopy hardwood forest (NFFL #8) typified as low flammability and low fire hazard. Riparian areas have lower flammability, but higher hazard because of higher fuel loads near the ground (NFFL #9). Riparian areas are found in such areas as Arroyo Hondo and Alameda Creek.

2. Weather

Background - Weather conditions significantly impact the potential for fire ignition as well as the rate, intensity, and direction in which fires burn. Wind, temperature, and humidity are the more important weather variables used to predict fire behavior.

Wind is considered the most variable and difficult weather element to predict. However, wind direction and velocity profoundly affect fire behavior. Surface winds, which travel within 20 feet of the ground, affect fire intensity by supplying oxygen to the flames. Wind increases the flammability of the fuels by removing moisture through evaporation and by angling the flames to heat the fuels in the fire's path. The direction and velocity of surface winds can also control the direction and rate at which the fire spreads. Aloft winds, which move at least 20 feet above the ground, can carry embers and firebrands downwind, causing spot fires to precede the primary front. In closed canyons and narrow valleys, aloft winds can facilitate the development of convection columns, which dry surrounding fuels and carry firebrands to unburned areas. Gusty winds cause a fire to burn erratically, making it more difficult to contain.

Many factors affect wind speed and direction. General winds are dictated by the earth's rotation. These winds are quite consistent at a regional scale and affect the large scale weather pattern of the area. For example, the general winds in the Bay Area blow from the west in the summer and south-west in the winter. Small scale wind patterns, specific to the hills and valleys of the landscape, are dictated by local geographic features. For example, diurnal shifts in local wind direction occur along the coast where day time off-shore breezes shift to off-land breezes at night. A similar pattern occurs in mountainous regions where rising, sun-heated air generates an upslope breezes during the day and night-cooled air slide downslope at night. Such terrain controlled winds are more prominent under clear skies and low humidity and can profoundly affect the rate and direction in which a fire burns. This terrain-controlled wind could be expected in such pronounced canyons as Wilms Gulch or in the Arroyo Hondo drainage.

Relative humidity is the amount of water in the air in relation to the maximum water holding capacity of air at a given temperature. Warmer air is capable of holding more water than cooler

air. Thus, 80% humidity at 90 degrees F. describes air with more water than the same volume of air at 60 degrees F and 80% humidity. In terms of fire, warm air with low relative humidity is a stronger drying agent than cool air of the same relative humidity, since warm air can hold, or "steal" more water than cool air. Since water, even as air droplets, takes more energy from the fire to heat up than does dry air, conditions of high humidity tend to have a suppressing effect on fires. High temperatures and low humidity optimize conditions for the ignition and spread of wildfires.

Frequently, both temperature and humidity oscillate diurnally, with the temperature climbing during the day to peak in mid-afternoon and sinking to a daily minimum in the early morning hours. Relative humidity usually varies inversely to the temperature, making late afternoons the direst and hottest periods of the day. Of course, temperature and humidity are affected by local weather patterns, which may blow in very dry and warm or cool and moist air masses at any time of the day.

The watersheds have a dry season of approximately 150 days, annually. Under these conditions there are 15 days each year of extreme fire weather conditions. Wildland managers study the 90th percentile and worst case fire conditions in managing for fire hazard control. The 90th percentile fire conditions describe the 10% most extreme fire-inducing weather conditions. The weather of greatest concern for fire protection is characterized by hot, dry, windy days. These conditions maximize ignitability and make fire suppression difficult. For example, they would include the average of the 10% driest, hottest, and windiest days reported in an area. Worst case conditions are identified by the worst extreme values recorded for a given area. Managers apply the 90th percentile and worst case conditions to predictive models in order to identify (and avoid) fire behavior under very challenging weather conditions. In this way, plans can be made to handle all fires that could occur in an area. The conditions recorded on the 10% driest, hottest, and windiest days observed are identified to yield an estimate of worst case conditions.

Description of Local Weather - The weather in the Alameda watershed is typical of a Mediterranean climate. It has warm, dry summers and cool, moist winter. On the average, the area receives about 16-24 inches of precipitation a year. Rainfall is likely to increase with elevation Most measurable rainfall occurs from mid-October to mid-April. Thus, May to October is the time of highest fire danger and this dry time constitutes the fire season.

Summertime temperatures are usually quite warm, often well over 100 degrees Fahrenheit. The same fog that moderates summertime temperatures around the San Francisco Bay rarely spreadds to the Alameda Watershed because the Watershed sits behind a significant range of moutains and because it is further inland. The same range of moutnains slows fog-induced westerly winds. As a result, air is generally hotter and calmer than lands located further west.

While the wind normally blows from the west, the most severe fire weather occurs with strong north or northeast winds. Under these conditions (which are common in the fall), humidities drop to 20% and temperatures soar to over 100 degrees Fahrenheit. Northerly or northeasterly winds would be particularly troublesome because they would be aligned with several canyons in the watershed such as the Sunol Valley and with the valley that contains Calaveras Reservoir. The easterly winds that helped spread the 1991 Oakland Fire do not blow with the same intensity in the hills of Alameda watershed. However, this overall weather pattern creates extremely low humidities and enhances the possibilities of ignition and extreme fire behavior.

Weather data was collected from the CDF Morgan Hill station, located to the south of the Alameda watershed. While this station is located at some distance from the Alameda Watershed, the CDF judges the data as representative and uses this data throughout Santa Clara and Alameda counties to plan fire suppression levels and resource allocation. The temperature, humidity and wind speed were observed at the station at 2:00 in the afternoon during the fire

season for the years 1980-1991. The other weather station which observes these important fire weather factors is located at 2150 elevation, to the south and east of the Alameda Watershed. While the weather observations at the Sweetwater Station may representative of the Alameda Watershed conditions, data has not been collected for a long enough time to provide data which encompasses the same time span.

The highest temperature recorded was 108 degrees F, on July 17, 1988. The minimum relative humidity that occurred as 8%, which is extremely dry; kiln-dried wood normally has a moisture of 12%. The highest wind speed recorded was 29 miles per hour.

Using a data base of 1485 days in which weather was observed, the average worst temperature (the temperature that occurs on 10% of the days during fire season) was 94 degrees F. The average worst humidity was 22%, and the average worst wind speed was 13 miles per hour. While the temperature is not exceedingly warm under these conditions, the humidity is alarmingly low (anything under 30% is considered extremely dry), and the wind speed is quite high. Fires ignited under these conditions, fanned and driven by the wind, would burn and spread vary rapidly. The wind blew from the west or northwest for over the majority of the hottest 10% of the days. Winds from the east only occurred 12% of the time on these hot days.

While the wind normally blows from the west, the most severe fire weather occurs with strong north or northeast winds. Under these conditions (which are most common in the fall), humidities drop to 20% and temperatures soar to over 100 degrees F.

The steep topography in the watershed creates its own wind so that up-canyon drafts in the morning and down-canyon drafts in the afternoon can be expected. Additionally, the many canyons can divert the wind so that, for example, a prevailing westerly wind is oriented more to the south. Lastly, bowls that are formed by the convoluted topography such as along Arroyo Hondo is the type of topography which is conducive to whirlwinds. Whirlwinds cause uncontrollable fire behavior, and complete consumption of all biomass.

3. Topography

Role of Topography In Fire Behavior - Topographic features, such as slope, aspect, and the overall form of the land, have a profound effect on both the abiotic and biotic components of an area's ecology. For example, topography influences local weather patterns, vegetation types and distribution, and creates microclimates with localized moisture conditions. By influencing the local wind, fuel, moisture and heat availability, topography directly and indirectly affects the intensity, direction, and spread rate of wildfires.

Large topographic features, such as mountains, affect the local weather patterns. Orographic thunderstorms are formed when an air mass flows up a mountain slope, is cooled, and releases the moisture it can no longer hold. Foehn winds, also known as Santa Ana or Mono winds, form as this dry air descends down the leeward side of a mountain and is warmed and channeled through saddles and mountain passes.

Local winds are also affected by an area's topography. In mountain regions, the less dense, sun-heated air rises upslope during the day, generating upslope afternoon winds. At night, the mountain air cools, and slides toward the valleys generating downslope drafts in the late night hours. The sun warmed air in the valley is displaced by the descending cool night air, and rises to the mid-slope zone. As a result, the mid-slope zone actually has a higher average temperature, lower relative humidities, and higher potential fire hazard than the other elevations. Surface winds can be slowed and dispersed into erratic gusts by rough, rocky, or

forested terrain. The speed, regularity, and direction of the wind directly influences the rate and direction in which a wildfire burns.

Winds form when air, heated by either a fire or the sun, rises upslope. These winds are stronger along steep slopes than along gentle ones. As a result, fires travel up the steep slopes faster, and in a more narrow wedge than do those that occur along gentler slopes. Fires burning in flat or gently sloping areas tend to burn more slowly and to spread more horizontally than fires on steep slopes. Similarly, fires ignited at the base of a slope spread farther and more rapidly than those ignited at the top. In contrast, ridgetops, rivers, and roads act as natural fire breaks since they are devoid of, or in fuel.

Both slope aspect, the direction the slope is facing, and slope position, lower, mid, or upper-slope, affect moisture availability and vegetation. South and southwest facing slopes receive the warmest direct sunlight for the longest period of the day. Therefore, these aspects tend to be drier and support more dry-site species, than do the north and north-east facing slopes, The soil and downed fuel along steep slopes also receive more direct sunlight, and are drier than those on gentler slopes. Sun and wind exposure are also greater along the upper third and ridgetops, making moisture less available than in the more protected areas along the lower slope and valley floor. As a result, lower elevation areas support more vegetation, and offer a larger fuel supply. These factors work together to influence the overall fire hazard associated with an area. For example, the low to mid-elevation, southwest facing steep slopes would have a higher fire hazard than the high elevation northeast facing slopes.

Description of Local Topography - The Alameda Watershed is on the western flank of the northern Diablo Range with northwest-trending ridges and valleys. Slightly more than 1/2 of the entire watershed is greater than 20% steepness, one-quarter is steeper than 40%. Approximately 18 percent of the land is between 10- 20% slope steepness. Approximately 14% is flat.

The topography consists of the Calaveras rift valley which trends northwest through the length of the watershed, a major east-west valley (the La Costa Valley and San Antonio Creek valley) and rugged terrain elsewhere. Most tributaries made of narrow "V" shaped canyons. boundaries.

Elevations range from 230 ft elevation at the north end of Sunol Valley to 3300 ft elevation in extreme southeast corner of the watershed. While Sunol Valley is broad and flat, Alameda Creek drops in elevation quickly along Niles Canyon - to 180 ft just west of the SFWD western boundary.

SFWD lands encompass several local drainages on the east and west side of Alameda Creek. They range in elevation of 2000 ft near Mission Pk., 800 ft between Pirate and Sheridan Creek. On the east side, several small drainages with headwater elevations of 1200 ft, are within SFWD

In the Calaveras basin slopes are steep, with an average gradient of 30% to 100%. While major valleys are nearly level, steep sloping canyon walls are found along Arroyo Hondo and complex, steeply rolling areas within the Calaveras Creek sub-basin exist. The Arroyo Hondo watershed extends for 100 square miles.

The San Antonio Creek basin encompasses 40 square miles, with much of the watershed located outside the Alameda Watershed boundaries. The northeast boundary of the watershed coincides with the SFWD boundary. The highest elevation in the San Antonio Creek basin within the Alameda Watershed ranges from 1800 feet to 1300 feet; these higher elevations are located to the south of San Antonio Creek.

The SFWD lands extent up the Alameda Creek valley to 1200 ft elevation at creek crossing and extend upslope to Oak Ridge on the south and Valpe Ridge on the north to form just a portion of the 35 square mile watershed. The boundary on the northern side of Alameda Creek is just south of Apperson Ridge near the headwaters of Welch Creek.

4. Values at risk

Safety - The greatest concern is injury and loss of life. The safety of SFWD personnel is the target of many safety campaigns and several regulations. Another danger to SFWD employees as well as visitors to the watersheds is a wildfire. Another serious concern is the possible threat to life and safety of the public outside SFWD property resulting from a wildfire on or passing through SFWD lands. As was the case in the 1991 Tunnel Fire in Oakland, people can perish both in the process of evacuation as well as in attempts to protect their property. Lastly, there is a risk to the firefighting personnel resulting from a fire.

The locations where the greatest threat to safety generally occurs in areas of dense population with poor access (narrow, windy and steep roads serving large numbers of people). These do not occur on SFWD property, but fall very possibly outside and near the boundary. Because the number of roads is few and quality poor, a situation exists in SFWD where, if a fast-moving fire were to occur, staff and/or firefighting personnel could become trapped.

Developments, Improvements and Property - SFWD has many improvements of considerable value that could be damaged by wildfire. SFWD owns cottages and filter plants which are vulnerable to fire. Additionally, distribution lines which are not buried, old flumes, fences, filter plants on the property, communication stations, roads would also be damaged by a wildfire.

Lastly, improvements off SFWD land is a concern because a fire could start and burn off or through SFWD property. These are generally comprised of dwellings, but also include automobiles, telephone and power poles, and personal possessions. Residences are concentrated on the western border of the watershed as well as in an isolated development in upper Welch Creek. The most sensitive areas are in residential areas of high fuel loads, those areas which lack clearance around structures, areas of steep slopes, and areas of poor access. In these situations there are few places exist for firefighting personnel to make a stand. Additionally, fire behavior is expected to be erratic and difficult to suppress in these circumstances.

Natural Resources - A vital natural resource in the SFWD land is the water which runs off the slopes into the reservoirs below. While not directly damaged during a wildfire, both water quality and quantity are unquestionably altered with a large wildfire. Increased sedimentation is the aspect of water quality most affected by a wildfire. This sedimentation has an added detriment by diminishing the capacity of the reservoir. The magnitude of these types of damages is related in part to both the extent of the fire as well as the location in relation to the reservoir. Fires which burn most of the slope above a reservoir or, to a lesser extent, fires which are located directly above a reservoir without a buffer.

Efforts to suppress a fire can also result in damage to water quality and cause increased sedimentation. Areas scraped bare by bulldozers to form control lines can cause significant erosion. Suppression efforts can also damage vegetation. Locations of "listed" plants are particularly vulnerable to this type of damage.

There are few circumstances where vegetation itself is sensitive to fire. Fires of all intensities, sizes, seasons, and frequencies have burned throughout the millennia. However, the

distribution of the characteristics of fires have been recently altered such that more fires are large and of high intensity. Few fires of low intensity burn in California and in particular, on the SFWD property. In oak stands, for example, fires of low intensity were likely to be frequent before settlement time. Disturbance has been minimal since the turn of the century (or longer) and a significant understory has developed. Now, should a fire burn these type of oak stands, the older trees would be harmed and many would die. A portion of the oak trees should be expected to resprout from the base of the tree, but some will not recover.

Rare and endangered species commonly require fire to either provide for germination or alter the micro-habitat so it can grow (i.e. remove thatch or shading plants). Some species may be sensitive to a lack of fire's occurrence. For example, a "listed" manzanita which occurs on Marin Municipal Watershed District lands requires fire for germination, but no fire has occurred for many decades and the stand is becoming decadent. Because the length of viability of the seeds is unknown, an experimental burn is recommended there for this sensitive species (Leonard Charles 1993).

In other locations where rare and endangered species occur a wildfire may set the stage for invasion by alien weeds which could out-compete the native sensitive species. The response by the site is determined in part by the season of the burn, the fire behavior itself, and the proximity to alien seed sources.

Rarely, two fires will burn so close in time that the species which require seed for propagation are harmed. The species may not have had enough time to reach seeding maturity and thus new seeds for the next generation would not be present. As a result, that species would become locally extinct or at least infrequent.

5. Jurisdictions

The entirety of the San Francisco Water Department lands is within State Responsibility Areas and as such, is protected by the California Department of Forestry. The station nearest to the Alameda Watershed is the Sunol Station, located in Sunol.

6. Neighborhood Context

The land surrounding the Alameda watershed has a complex ownership pattern. Public parks (owned by the Santa Clara County and East Bay Regional Park District) are located to the west and in the middle of the eastern side of the watershed. Small private parcels (which are both used as small ranches and private residential) are also located to the west and north. Large ranches are generally located to the east and south of the watershed.

C. HISTORY/ROLE OF DISTURBANCE

Every vegetation type has its own disturbance regime. This is defined as the timing, extent, and type (intensity) of disturbance. Fires may comprise the most frequent disturbance, however, flooding, erosion, mass wasting, wind-events, harvesting and grazing are all disturbances that the biota must respond to. Determining the nature of past disturbances may suggest future actions and precautions.

1. Fire History

For the Alameda Watershed, fire history was not available in written reports. In fact, the data is based on recall of staff members of the San Francisco Water Department and the California Department of Forestry and Fire Protection or historical newspaper reports. Boundaries of the fires are typically not completely accurate, the year of the fire may vary one to three. One should expect that smaller fires would be forgotten over time, and this data base reflects that trend. The earlier fires marked and spoken about were larger fires. Small fires were not brought up, although it is likely they occurred with a frequency that is generally similar to the present.

Regardless, patterns of ignition location, frequency, associated vegetation and cause can be generated from this information. Using fire history information, an investigator can also infer Successional development in vegetation, and gain insight regarding fuel characteristics and potential fire effects.

Fire history information can identify areas where management action may be warranted. For example, access routes were locations of a higher incidence of fire; lands adjacent to these access routes may benefit from vegetation manipulation, or other methods to reduce ignition (such as road closure during high fire danger). In another example, a lack of fire occurrence in a shrub area may indicate an accumulation of dead wood and biomass. This, coupled with other factors, would suggest treatment to reduce fire hazard.

Number of Fires - There were 33 fires recalled on the Alameda watershed since 1964, and 14 since 1990. While it is not unusual that more fires were remembered in recent times, seven fires (which is by far the highest number of ignitions in the 30 year period) occurred in 1991 alone.

Normally, one fire per year was remembered. However, seven fires were reported for the year 1991, and three in 1990. No fires were remembered for the years 1985, 1982, and 1976-79.

Distribution of Fires - A pattern has developed of ignitions close to public roads (principally Calaveras Rd). Ignition occurs more often down from the road rather that above it. Another location of high ignitions is off Highway 680 near the intersection with Highway 84, where six fires started within the last four year period. All but three fires during the past 30 years were within 1/2 mile from a public road. Most occurred directly adjacent to Calaveras Rd. Fires have occurred in the vicinity of Welsh Creek at least twice in the last 30 years; each of these were approximately 30 acres in size.

Fires occurred exclusively on the west side of reservoirs. There were none on SFWD property in San Antonio watershed within the last 30 years.

Cause of Fires - The most common cause of fires has been use of mechanical equipment , which includes devices such as trains, motorized vehicles, chainsaws, tractors, and weed whippers. The hot box of a Western Pacific train caused a fire in 1964 that burned over 250 acres in Sheep Camp. Overheated wheels of a large truck started a fire in 1969 in Vallecitos Rd. which burned approximately 400 acres. One fire in 1973 that burned 200 acres was set with a fusee.

Arson is generally the cause of 20% of the human-caused fires in California, and the percent of fires set under suspicious circumstances is similar in the Alameda watershed.

One known lightning fire occurred within the 30 year span of this fire history. This fire happened in 1984 in the southern portion of the Calaveras watershed area. The rest of the fires were human-caused.

Size of Fires - Approximately 1670 acres have burned in the last 30 years in the Alameda Watershed, for an average of 55 acres (or .13%) each year. This is slightly higher than the State average of 10% per year. Few fires have burned large acreage. Almost one-half of the fires were under 10 acres in size, and almost half of those were estimated as one acre or less.

The most recent fire that was estimated to have been 100 acres or more occurred in 1980; since that time, fires have been smaller. Between 1980 and 1964, six burned each over 100 acres. The largest fire in this fire history was estimated at 400 acres; this fire occurred in 1969.

Improvements Burned - No threats to private homes have resulted from wildfires. However, one structure at the southern end of Calaveras Reservoir burned in 1993 which also consumed a minor amount of vegetation as well.

2. Storm-Caused Damage

Storm-related damage creates additional dead fuels (sometimes in already decadent stands), which will remain until treated and removed, or a fire occurs. Vegetation which is damaged includes tall trees, even tall brush, wherever high branch rose above the general canopy level. Damage includes all sizes of fuels - from fine fuels to large logs. The importance of a wind event such as occurred in December, 1995 is underscored by the Spokane Firestorm of 1991. There, wind trees were blown across power lines, causing 92 fires. These fires were then fanned by the high winds to cause significant damage.

3. Disturbance Through Mass Wasting and Erosion

The most frequent type of disturbance is fire, however, disturbance through mass wasting (landsliding) and surface erosion also forms an integral part of the total disturbance regime which sets back sucessional stages and provides diversity in age classes.

Numerous soil types have erosion hazard ratings of severe and very severe. Soils are moderately eroded. Accelerated erosion historically occurred through sheet erosion and gully erosion. Few upland soils except those of the Positas formation are highly erodible. Soils are sensitive to disturbance and are highly erodible under several land uses. Removal of protective plant cover has also caused erosion. Over 50% of the area has soils described as moderate top soil erosion. Few areas that contribute to the Calaveras Reservoir are not eroded or highly susceptible to erosion, Many areas are susceptible to both surface erosion and slope instability.

Landslides are common; most upland watershed areas are unstable, and moderately unstable. Generally major landslide are located with faults, for example, on the east side of Pleasanton Ridge, upslope of SFWD lands along Arroyo de la Laguna. A few landslides occur along Niles Canyon and west side of Sunol Valley.

The Calaveras Creek watershed has many dispersed small landslides and few large. Arroyo Hondo areas and shoreline southeast of Calaveras dam have extensive, nearly continuos areas of large landslides. The largest is on north east side of Arroyo Hondo, the boundary follows the ridge.

The largest landslide in the Alameda basin is along both sides of Alameda Creek.
The most extensive areas of large landslides and high hazards are in the Upper Alameda Creek and Calaveras Reserve basins. In addition, the southeast portion of San Antonio Reservoir basin and the corridor along Arroyo de la Laguna and Niles Canyons have large existing landslides and/or high susceptibility of slope failure. The largest, most numerous and most extensive areas of landslides in the San Antonio basin are along Williams Gulch and San Antonio Creek.

II. ANALYSIS

A. HAZARD RATING

There are several ways to rate fire hazard. Some methods rely on fire behavior predictions, others consider various suppression factors such as water supply and access, and still others include the values at risk as a factor in determining hazard. NASA uses infrared photographs which displays the plant vigor, foliar moisture, and proportion of dead material as a means of identifying hazard in brush. This analysis was conducted on the Peninsula watershed for a five to seven year period. For this planning effort, the SFWD evaluated hazard using three methods. The hazard (or more accurately , the severity) was mapped in accordance with rules defined under the California Wildfire Severity Law, AB337. Static fire behavior predictions were run using BEHAVE, and fire spread and growth potential were evaluated using FARSITE.

1. Methodology

California Wildfire Severity Law, AB337 (Bates 1992)- The ratings mandated by the California Wildfire Severity Law is designed to incorporate indices of three criteria into one general hazard index that can be used to direct fire management activities. The minimum size of the zones of fire hazard severity is, by law, one square mile. The ratings are based three criteria: structure density, slope steepness, and type of fuels. Ratings can be slightly altered by considering unusual weather or fire history. Points are attributed to the severity of each of the criteria, and the points are then added to arrive at a total fire severity rating. This fire severity index varies from one to ten, with each of the three components contributing relatively equally. Areas with a total of seven or greater are described as very high severity and thus should be a focus of management efforts. Areas with a total of four to seven are a "moderate" fire severity under this categorization scheme and can be considered "moderate" in the sensitivity analysis. Areas with a total of three or less are "low" fire severity.

Steep areas with voluminous biomass that abut a high density of structures would be described under this rating as having a high potential damage (or as high sensitivity for this discussion). Conversely, areas of grass on flat lands far removed from structures would be rated as having the lowest potential damage (and low sensitivity). Because the size of the fire severity rating covers one square mile, the density of structures in the proximity to SFWD lands becomes important even though SFWD lands themselves do not contain many structures. This methodology is appropriate because a fire can easily cross the boundary both onto and away from SFWD property. The weighting of the factors in this ranking system is such that an area with steep slopes and heavy fuels automatically rates a high wildfire severity. Also, the highest scoring is attributed to a density of only one structure in every five acres; thus almost all residential areas are a focus in this ranking system.

The statewide mapping of very high fire severity was intended to serve several purposes. First, those locales with very high fire severity will be ***required by law to promulgate regulations designed to reduce fire losses through more fire safe construction and development as well as increased vegetation management***. Second, the mapping is intended to help educate residents in these very high fire severity areas of the potential for catastrophic losses through wildfire. The ultimate goal of the State for mapping these areas is to reduce losses of property, increase life safety and decrease suppression costs.

The slope data was derived from an enhanced version of a Digital Elevation Model. This data layer is discussed in more detail in other reports regarding the source of all topographic information. The categories were taken from the National Fire Protection Association Standard 299 (California Department of Forestry and Fire Protection 1993). Dwelling density was

interpreted from aerial photographs (at 1:36,000). The categorization of dwelling density and slope steepness was provided by EDAW, Inc. The categorization of fuel hazard was derived from fuel model maps which, in turn, is based on vegetation type classifications. Photographic interpretation of wildland fuels outside the watersheds was directly categorized into the fuel hazard category instead of derived from fuel models. Most residential areas are arbitrarily assigned a "high" fuel hazard category (this is per the implementation guidelines being developed for the California Wildfire Severity Law), however, areas void of vegetation were classified as a low ("1").

A point is assigned to each of the conditions (fuel, topography, and dwelling density) on a square mile parcel of land. Points are added from each of the three criteria. Those lands with a total of seven or greater are to be classified as very high fire hazard severity. The total number of points can be slightly adjusted by local government to take into account local fire weather conditions, fire history, and topography. Additionally, stringent local ordinances regarding fire safe building practices can also adjust the total.

Table 1. Table of criteria used to rank fire hazard severity

Fuels Criteria	*points*	*Slope Steepness*	*points*	*Dwelling Density*	*points*
grass, small shrubs	1	0-10%	1	under 1 per 10 acs	1
brush, small trees	2	10-20%	2	1 per 5 - 10 acs	2
timber, woodland, large brush	3*	20-40%	3	1 or more per 5 acs	3
		over 40%	4		

* includes landscaping

BEHAVE - BEHAVE is a computerized fuel and fire behavior prediction model developed by the USDA Forest Service at the Intermountain Forest Fire Research Laboratory. BEHAVE integrates the factors of topography, fuels, and weather for any one time based on heat transfer algorithms. Results of the model are predictions of flame length, rates of spread, fireline intensity, and heat per unit area.

The basis of this classification is a group of 13 models developed at the Intermountain Forest Fire Laboratory in Missoula, Montana for use in the computerized fire behavior prediction system BEHAVE (Rothermel 1983). It was determined that for the purposes of this phase of planning, the plant community boundaries established by ESA, Inc. could be adequately correlated with current fuel models to carry out fire behavior modeling. Fuels on the Peninsula Watershed were surveyed on aerial photographs (color at 1:36,000, color infrared transparencies at 1:24,000-29,000), in the field, and then related to a draft vegetation type map under development by ESA, Inc. These various "Natural Communities" (Holland 1986) reflect current vegetation composition of dominant species, as well as variable characterization of the associated plant/fuel structure. Each community type was visited in the field to address fuel modeling for future fire behavior modeling efforts. Field reconnaissance was conducted after full cure of herbaceous vegetation in early July, 1993. Grass was mapped as potential fuel volume, so the biomass reduction due to grazing was not considered. Fuels outside the watershed boundary were categorized per the California Wildfire Severity classification because vegetation communities were not mapped.

The same methodology was used to obtain topographic information for the watershed as for the analysis under the California Wildfire Severity Law. Weather conditions were selected as representing the 90th and 95th percentiles of conditions during the fire season. This data was obtained from CDF weather station in Morgan Hill. Winds were estimated as blowing from the northwest for the 'high' fire behavior prediction and from the northeast for the 'extreme' fire behavior prediction.

Because the BEHAVE program was designed to predict fire behavior on a specific set of conditions, another program was needed to enable prediction of all conditions of the watershed simultaneously so a spatial distribution of hazards could be represented. Mr. Andy Richardson used this technique on the Peninsula watershed during completion of his masters thesis at San Fransicso State. He duplicated the procedure using updated information to produce the attached maps of BEHAVE outputs.

FARSITE - The computer program FARSITE is developed by the USDI National Park Service, and is currently supported by both the USDA and USDI. FARSITE is based on the heat transfer algorithms developed in BEHAVE and calculates the direction and rate of fire growth using the same inputs (and more) as the BEHAVE program. While FARSITE does not portray fire behavior throughout the watershed, it allows managers to see predictions of where a fire might spread over time under various weather conditions. All other fire behavior predictions (such as flame length, rate of spread, heat per unit area) are all available on a site-specific basis during the time and in the location of the simulation.

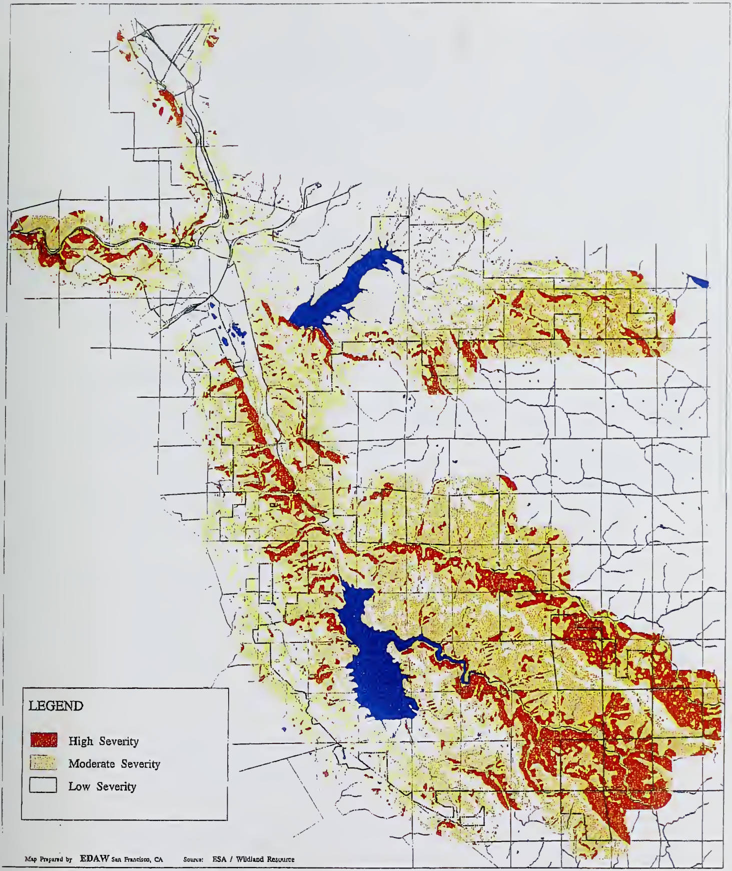
The same fuel data sources were used for the FARSITE as for the analysis using BEHAVE. Weather data were developed to represent the 90th percentile weather conditions, and the 95th percentile weather conditions, with both winds from the northwest and northeast. The weather condition with winds from the northwest are intended to represent the condition where dry, hot off-shore flow (or stagnant air) prevailed for the preceding days before the wind shifted to a northwesterly direction.

2. Analysis Results

Spatial Distribution of AB337 Hazard Rating on the Alameda Watershed **-** Because fire spread does not consider land ownership boundaries, the areas outside the San Francisco Water District lands, but within 2000 feet of the boundary were mapped. The acreage figures reported in the following text details only lands within the SFWD boundaries, however the accompanying maps display the larger mapped area. The discussion of the distribution of the fire severity also considers the larger coverage, including those lands mapped outside SFWD boundaries.

The map areas void of any markings are the only places classified as low fire severity. This constitutes 10,426 acres, or roughly one-quarter of the 39,143 acres in the Alameda watershed. Areas with intermediary density of markings and combinations for fuel and slope markings are interpreted as moderate fire severity. This area encompasses 20,494 acres, or roughly one-half of the land inside the San Francisco Water District boundaries. Those areas with (1) a combination of dense slope markings and any type of fuel markings, or (2) dense fuel markings and any type of slope marking, or (3) built-up areas with any type of both fuel and slope markings comprise lands classified as high fire severity. These cover 5981 acres, or 15 percent of the Alameda watershed lands.

Little development exists inside the watershed. Instead, the fire severity classification is determined by the combination of slope steepness and fuel type. Steep topography throughout the Alameda watershed (with the exception of the north part of Alameda Creek, and parts of the basin surrounding the south side of Calaveras Reservoir) is rather steep--over 20% in steepness. On slopes greater than 40 percent steepness, vegetation cover other than grass will result in a high fire severity classification rather than moderate. And, in areas of heavy vegetation (generally consisting of woodlands), any lands with a slope steepness over 20% would be classified as high fire severity. As a result, the distribution of the "high" classification roughly



Map Prepared by **EDAW** San Francisco, CA Source: ESA / Wildland Resource

Wildfire Severity

ALAMEDA WATERSHED
SAN FRANCISCO WATERSHED MANAGEMENT PLANS

follows the distribution of heavy vegetation (such as scrub, and woodlands). The heavier vegetation is generally located on the north and east-facing slopes.

The areas of high fire severity can be roughly divided into five areas:

1. the steep drainages south of San Antonio Reservoir,
2. the east-facing slopes above Calaveras Rd.
3. the north aspects of Alameda Creek
4. the north-facing slope of Niles Canyon
5. the north aspects o Arroyo Hondo Creek and its tributaries.

Large portions of the slopes draining into San Antonio Creek and Williams Gulch are also classified as high fire severity because of the heavy fuels on the steep slopes. The north-facing slopes on the south side of San Antonio Reservoir, the north aspects of Apperson Creek, the upper reaches of Indian Creek (as it straddles the San Francisco Water District boundaries in Section 30), the portion of La Costa Creek that is south of San Francisco watershed in section 29 as well as a wooded strip just north of the SFWD boundary , are all classified as high fire severity.

In the Arroyo Hondo basin, two unnamed basins leading north to Oak Ridge are also classified as high fire severity because of the heavier fuels on the steep slopes.

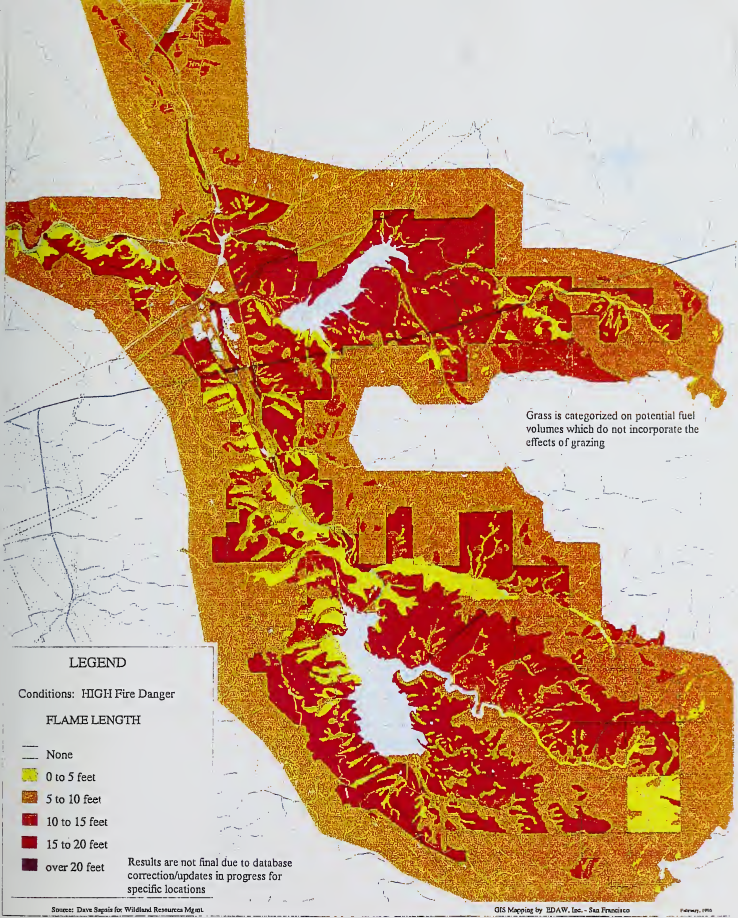
Smaller areas of high fire severity are found in two other locations.
The upper reaches of the slopes draining to Calaveras Creek are classified as high fire severity, as are the north-facing slopes along Niles Canyon.

Slightly less than one-half of the watershed, or 20,739 acres, is covered with light fuels, comprised of grass. Slightly less than one-third of the watershed, or 12,427 is covered with heavy fuels, which could be heavy brush or woodlands. Only 1,413 acres, or less than four percent is covered with moderate fuels described as light scrub or sparse woodlands.

The fire severity on lands outside the Alameda watershed boundary is generally consistent with lands inside the boundary. However, to the north of the SFWD lands, development is concentrated in the communities of Sunol and the southern reaches of Pleasanton along Highway 680. In addition, pockets of built-up areas are located to the west along Pirate and Sheridan Creeks, and to the southwest along Calaveras, Felter and Downing Roads. The topography is a mixture of steepness, along the watershed perimeter. The fuels are generally light on the western boundary with heavier fuels on the southeastern portion of the watershed, and grass surrounding the north east portion of the Alameda watershed.

Analysis of Potential Fire Behavior Using BEHAVE - The results display the difference in mapping criteria outside watershed land, with distinct land ownership boundaries. Additionally, fire behavior prediction in grass fuel types clearly indicated the dramatic fire behavior that is likely to occur if management actions such as grazing were not to continue.

The results using BEHAVE indicate the grassy nature of the watershed; fire behavior under high fire danger is characterized as fast-moving, with little heat output but dramatic flame lengths. Fire behavior in canyons and drainages is more benign, with flame lengths between 0 to 10 ft, however fire behavior on side slopes and ridgetops are almost uniformly extreme, with flame lengths predicted to be between 15 to 20 ft. With almost no exceptions, heat per unit area never exceeded 1000 btu/sqft under high fire danger. Rates of spread were slow (less than 50 chains/hr (or 50 ft/min) only in valley bottoms, and on the lower portion of the slope west of Calaveras Creek and Reservoir, and to a lesser extent, the slope southwest of Arroyo Hondo where spread rates are 100-200 chains/hr (or ft/min).



Grass is categorized on potential fuel volumes which do not incorporate the effects of grazing

LEGEND

Conditions: HIGH Fire Danger

FLAME LENGTH

- — None
- 🟨 0 to 5 feet
- 🟧 5 to 10 feet
- 🟥 10 to 15 feet
- 🟥 15 to 20 feet
- 🟪 over 20 feet

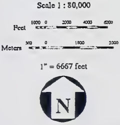
Results are not final due to database correction/updates in progress for specific locations

Source: Dave Sapsis for Wildland Resources Mgmt.

GIS Mapping by EDAW, Inc. - San Francisco

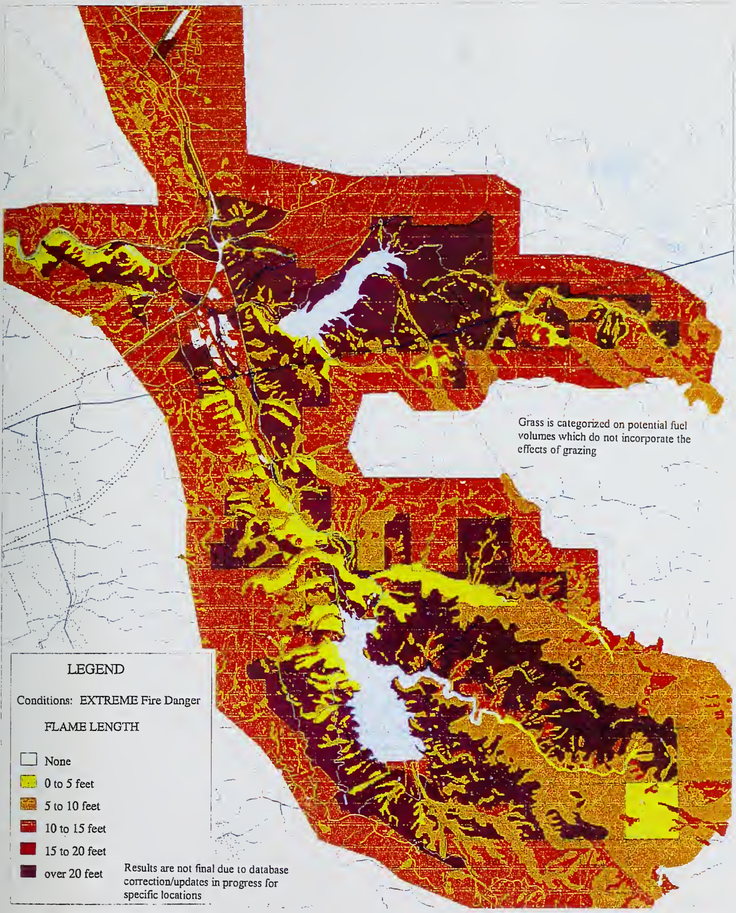
February, 1996

BEHAVE MODEL OUTPUT (Checkplot)



ALAMEDA WATERSHED

SAN FRANCISCO WATER DEPT -- FIRE MANAGEMENT PLAN



Grass is categorized on potential fuel volumes which do not incorporate the effects of grazing

Results are not final due to database correction/updates in progress for specific locations

Source: Dave Sapsis for Wildland Resources Mgmt.

GIS Mapping by EDAW, Inc. - San Francisco

February 1996

BEHAVE MODEL OUTPUT (Checkplot)

Scale 1 : 80,000

Feet 1000 0 2000 4000 6000

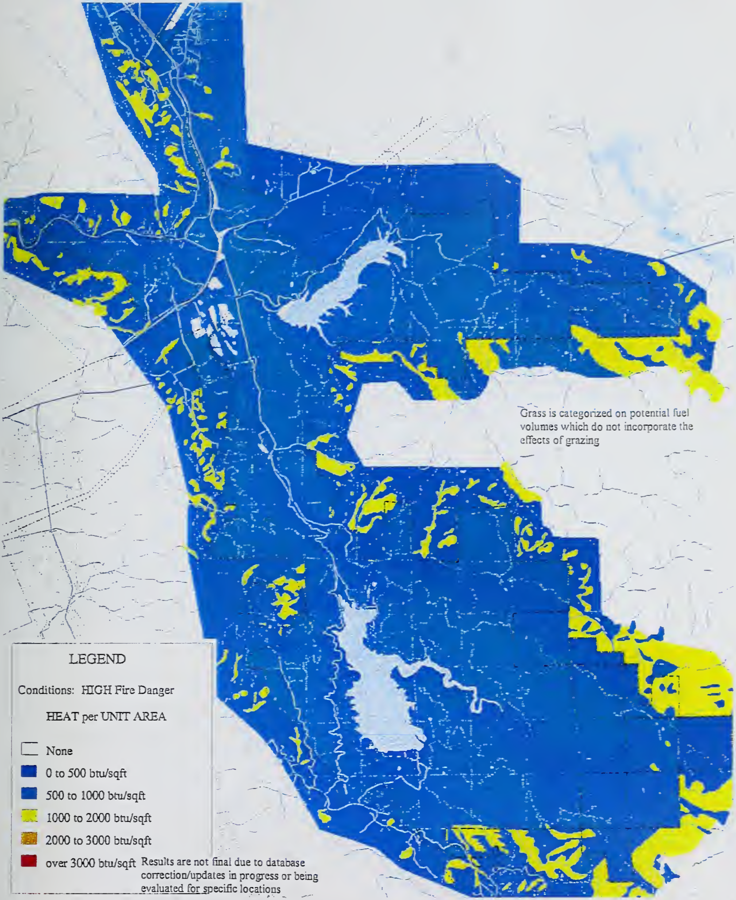
Meters 500 0 1000 2000

1" = 6667 feet

N

ALAMEDA WATERSHED

SAN FRANCISCO WATER DEPT -- FIRE MANAGEMENT PLAN


Grass is categorized on potential fuel volumes which do not incorporate the effects of grazing
LEGEND
Conditions: HIGH Fire Danger
HEAT per UNIT AREA
☐ None
🟦 0 to 500 btu/sqft
🟦 500 to 1000 btu/sqft
🟨 1000 to 2000 btu/sqft
🟧 2000 to 3000 btu/sqft
🟥 over 3000 btu/sqft
Results are not final due to database correction/updates in progress or being evaluated for specific locations

Source: Dave Sapsis for Wildland Resources Mgmt.

GIS Mapping by EDAW, Inc. - San Francisco

February, 1996

BEHAVE MODEL OUTPUT (Checkplot)

Scale 1 : 80,000

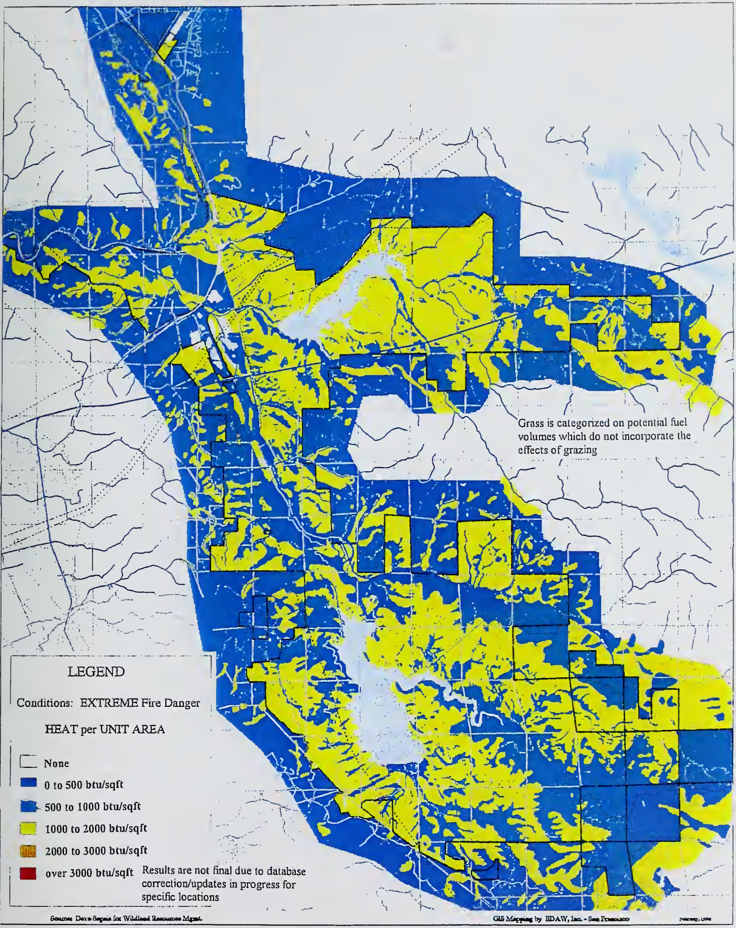
Feet 1000 0 2000 4000 6000

Meters 500 0 1000 2000

1" = 6667 feet

ALAMEDA WATERSHED

SAN FRANCISCO WATER DEPT -- FIRE MANAGEMENT PLAN


Grass is categorized on potential fuel volumes which do not incorporate the effects of grazing
LEGEND
Conditions: EXTREME Fire Danger
HEAT per UNIT AREA
None
0 to 500 btu/sqft
500 to 1000 btu/sqft
1000 to 2000 btu/sqft
2000 to 3000 btu/sqft
over 3000 btu/sqft
Results are not final due to database correction/updates in progress for specific locations

Source: Dave Sapsis for Wildland Resources Mgmt.

GIS Mapping by EDAW, Inc. - San Francisco

February, [illegible]

BEHAVE MODEL OUTPUT (Checkplot)

Scale 1 : 80,000

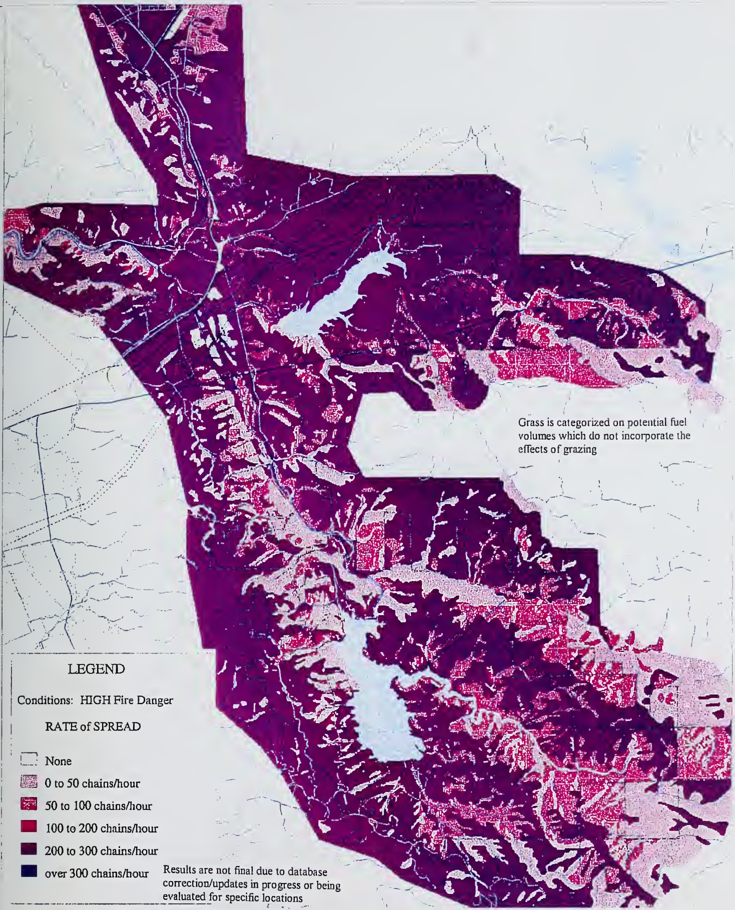
Feet

Meters

1" = 6667 feet

ALAMEDA WATERSHED

SAN FRANCISCO WATER DEPT -- FIRE MANAGEMENT PLAN



Grass is categorized on potential fuel volumes which do not incorporate the effects of grazing

Results are not final due to database correction/updates in progress or being evaluated for specific locations

Source: Dave Sapsis for Wildland Resources Mgmt.

GIS Mapping by EDAW, Inc. - San Francisco

February, 1996

BEHAVE MODEL OUTPUT (Checkplot)

Scale 1 : 80,000

Feet 1000 0 2000 4000 6000

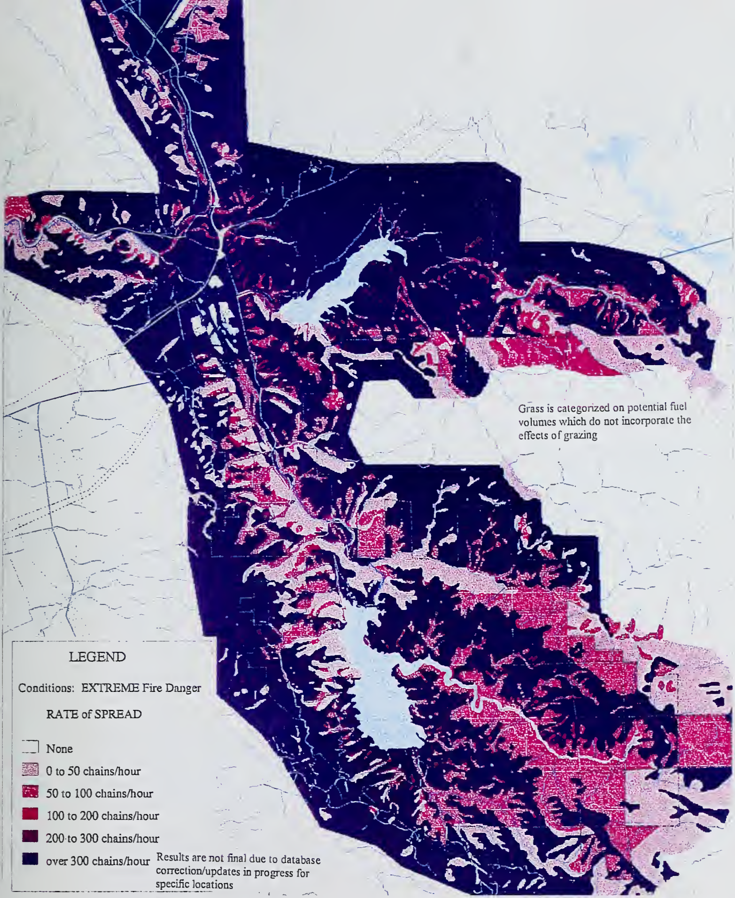
Meters 500 0 1000 2000

1" = 6667 feet

N

ALAMEDA WATERSHED

SAN FRANCISCO WATER DEPT -- FIRE MANAGEMENT PLAN



Grass is categorized on potential fuel volumes which do not incorporate the effects of grazing

Results are not final due to database correction/updates in progress for specific locations

Source: Dave Sapsis for Wildland Resources Mgmt.

GIS Mapping by EDAW, Inc. - San Francisco

February, 1996

BEHAVE MODEL OUTPUT (Checkplot)

Scale 1 : 80,000

Feet 1000 0 2000 4000 6000

Meters 500 0 1000 2000

1" = 6667 feet

ALAMEDA WATERSHED

N

SAN FRANCISCO WATER DEPT -- FIRE MANAGEMENT PLAN

Under extreme fire danger, a significant portion of the watershed is predicted to burn with flame lengths greater than 20 ft, and heat output from 1000-20000 btu/sqft. ***This type of fire behavior can be expected to challenge and outmatch fire suppression efforts.*** The valley bottoms and the lower portion of the slope west of Calaveras Creek and Reservoir, and to a lesser extent, the slope southwest of Arroyo Hondo, are nearly the only exceptions. Not surprisingly, rates of spread are among the fastest possible, spreading from 200-300 chains/hr (or ft/min).

Analysis of Fire Spread Potential Using FARSITE - At time of submittal, two simulations were run using the Alameda landscape and fuels data. Both fires were large at the end of the simulation, reflecting the fast-moving nature of grassy fuels and the drier nature of the environment in the Alameda location. The simulation in the northern portion of the watershed was run with a wind blowing from the west; the simulation on the southern border was run with a wind blowing from the north.

	duration	*size*	*1 hr fuel moisture*	*10 hr fuel moisture*	*100 hr fuel moisture*	*live fuel moisture*
A Nrth 1	3 hrs	960	3	4	6	80
A Mid 1	3 hrs	695	2	4	4	80 wdy, 100 foliar
Aeast2	3 hrs					
A South 1	25 min, 40 min	695	2	4	4	80 wdy, 100 foliar

	Ignition Time	*Temperature*	*Relative Humidity*	*Wind Direction*	*Condition*
A nrth 1	2 pm	80 degrees	32%	W	High
A mid 1	2 pm	94 degrees	8%	NNE	Extreme
Aeast2	2 pm	80 degrees	32%	W	High
A South1	2 pm	94 degrees	8%	NNE	Extreme

A North 1 - The ignition point for this simulated fire was on a switchback south of goat rock in Williams Gulch. With westerly wind, the fire spread into an old chamise stand. The fire created numerous spots and multiple fires further east. The fire largely stayed on the north-facing slope, and advanced to the east. The resulting acreage at the end of the 2 -hr simulated run was 960 acres.

A South 1 - A fire which started to the south of Calaveras Reservoir burned to the southern boundary of SFWD lands within 25 minutes. It burns 1/2 mile beyond the boundary in 40 minutes. The fire, which burned under a northerly wind, appears to advanced primarily by rapid surface fire spread rather than by numerous spots ahead of the fire front. The ending acreage at the end of 40 minutes was 695 acres.

AEast2 - A simulation of a fire which started off a fire trail on the northwest portion of Poverty Ridge burned east under a westerly wind into the Arroyo Hondo drainage to a size of 2800 acres within the 3 hour duration of the simulation. Embers which were thrown ahead of the fire front cross Arroyo Hondo and some tributaries, however, the vast majority of the are burned iwht low heat output.

AMid1 - A simulated fire on the north-facing slope south of Niles Canyon Rd. burned under a north-northeasterly wind to the boundary of the fuels data within 95 minutes. The size of the fire when it crossed the Alameda Watershed boudary was 700 acres.

FIRE GROWTH SIMULATION

Anrth1

Alameda Watershed

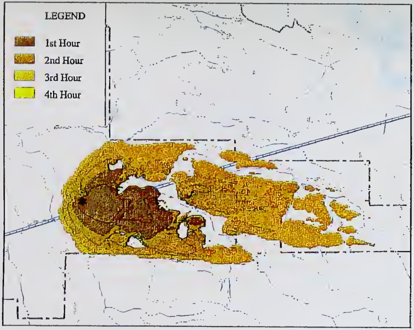
Fire Management Plan

San Francisco Water Department

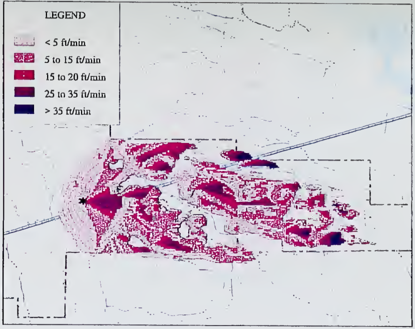
Conditions: HIGH FIRE DANGER

Ignition Time: 2pm
Temperature (F): 80 deg
Relative Humidity: 32 %
Wind Direction: Westerly (276 deg)

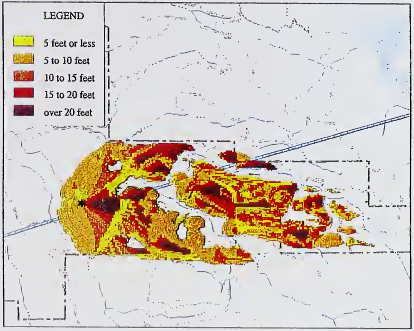
Time of Arrival



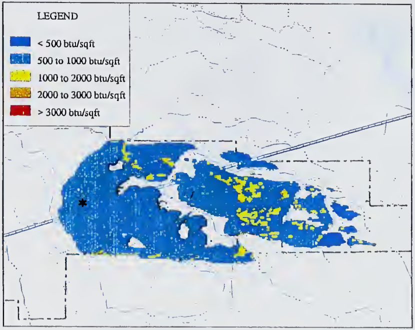
Rate of Spread



Flame Length



Heat per Area

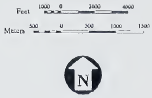


✱ Point of Ignition

Time of Arrival
(30 minute isolines)

Scale 1 : 48,000

1" = 4000 feet

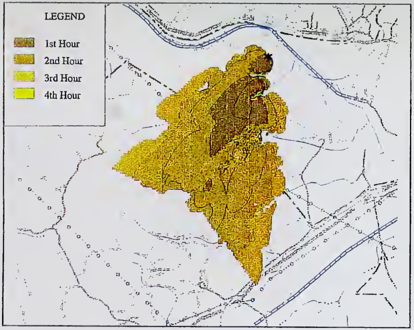


Data Source: David Sapsis for
Wildland Resource Management

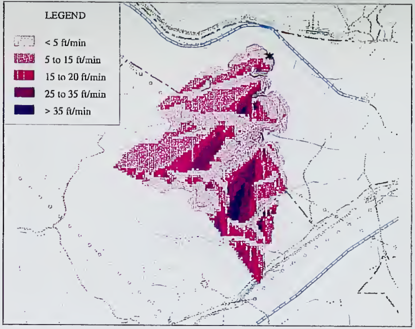
GIS Mapping by EDAW, Inc.

March, 1996

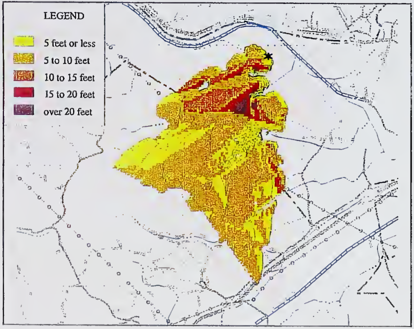
Time of Arrival



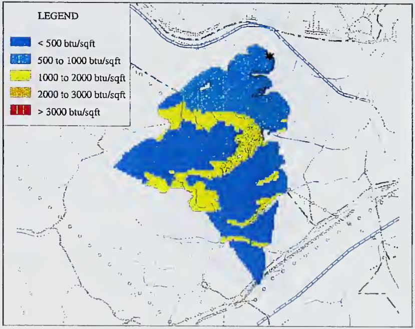
Rate of Spread



Flame Length



Heat per Area



FIRE GROWTH SIMULATION

Amid1

Alameda Watershed

Fire Management Plan

San Francisco Water Department

Conditions: EXTREME FIRE DANGE

Ignition Time: 2pm
Temperature (F): 94 deg
Relative Humidity: 8 %
Wind Direction: NNE (28 deg)

* Point of Ignition

Time of Arrival
(30 minute isolines)

Scale 1 : 36,000

1" = 3000 feet

Feet 1000 0 2000 4000

Meters 500 0 500 1000 1500

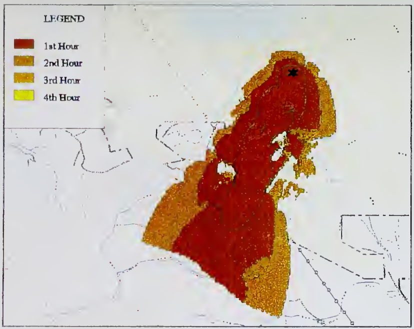
N

Data Source: David Sapsis for
Wildland Resource Management

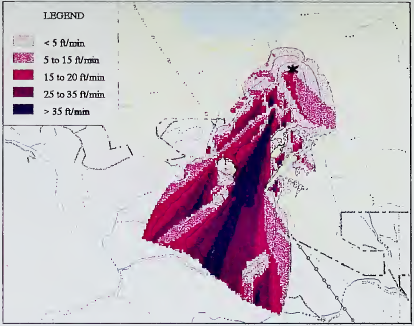
GIS Mapping by EDAW, Inc.

March, 1996

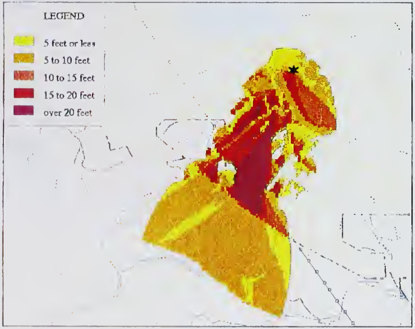
Time of Arrival



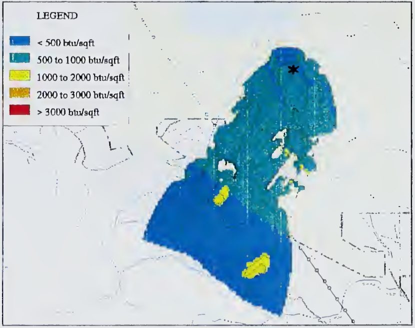
Rate of Spread



Flame Length



Heat per Area



FIRE GROWTH SIMULATION

Asth1

Alameda Watershed Fire Management Plan

San Francisco Water Department

Conditions: EXTREME FIRE DANGE

Ignition Time: 2pm
Temperature (F): 94 deg
Relative Humidity: 8 %
Wind Direction: NNE (28 deg)

* Point of Ignition

~ Time of Arrival (30 minute isolines)

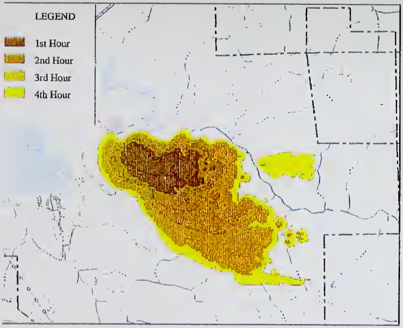
Scale 1 : 36,000
1" = 3000 feet

Data Source: David Sapsis for Wildland Resource Management

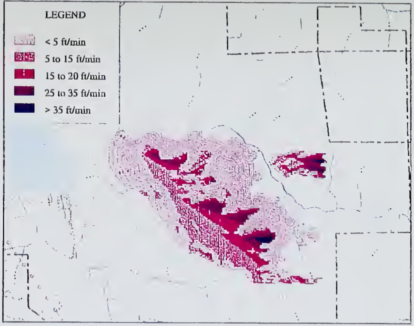
GIS Mapping by EDAW, Inc.

September 19

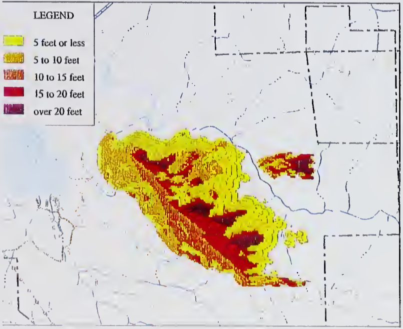
Time of Arrival



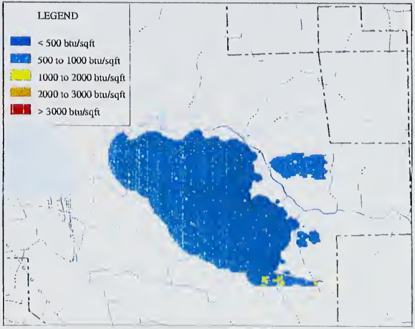
Rate of Spread



Flame Length



Heat per Area



FIRE GROWTH SIMULATION

Aeast2

Alameda Watershed

Fire Management Plan

San Francisco Water Department

Conditions: HIGH FIRE DANGER

Ignition Time: 2pm
Temperature (F): 80 deg
Relative Humidity: 32 %
Wind Direction: Westerly (276 deg)

* Point of Ignition

Time of Arrival
(30 minute isolines)

Scale 1 : 48,000
1" = 4000 feet

Feet 1000 0 2000 4000
Meters 500 0 500 1000 1500

Data Source: David Sapsis for
Wildland Resource Management

GIS Mapping by EDAW, Inc.

March [illegible]

III. FIRE DEFENSE IMPROVEMENT PLAN

Fire defense improvements include fuelbreaks, roads, water sources, gates and helispots, or heliports (Greig 1984) and aid in the effectiveness of fire suppression. The following discussion will address those defenses which do not involve vegetation management for fire hazard and risk reduction.

A. CURRENT CONDITION

1. Current Access

Access is generally referred to in this report as vehicular access, i.e. those suitable for fire equipment as contrasted with those not suitable - since the preferred mode of initial response to a wildland fire or unknown emergency is with a pickup truck.

Access to the Alameda Watershed is provided by four major county roads. Calaveras Rd. is paved with public access, winding along the west ridge and shorelines to and from the Sunol Valley and Milpitas. Marsh Rd. is graveled and gated to provide access to private lands east and southeast of SFWD lands. There is uncontrolled access on the Alameda Watershed for approximately one mile along Marsh Rd.; this uncontrolled portion of Marsh Rd. does not lead to any public facility nor private reisdences and offers potential roadside ignition sites.

Weller Rd. travels along the western ridge to private lands and communication facilities near Monument Peak and Mt. Allison, which can all be accessed from the north not using the portion of Weller Rd. on the Alameda Watershed. Weller Rd. currently has uncontrolled access although for approximately two miles - the majority of its length - it travels across the Alameda Watershed where it presents the possibility of roadside ignitions which could be difficult to surpression due to the flashy nature of the fuels. Welsh Creek Road runs east from Calaveras Rd. to private parcels off the watershed north of Arroyo Hondo.

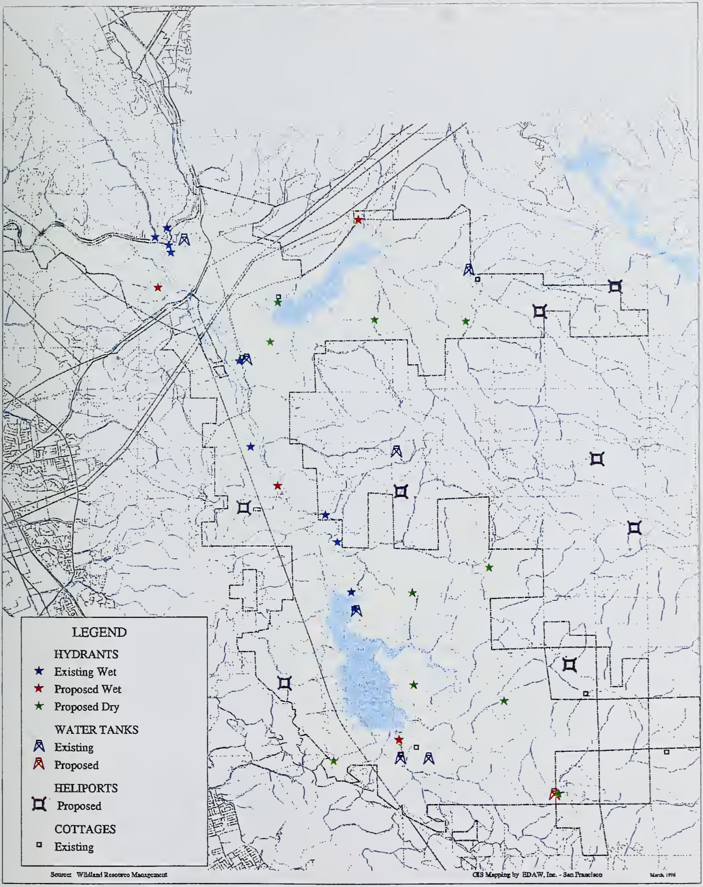
Other gravel/dirt roads along Poverty Ridge, Strawberry Pt. (the east shore of the reservoir by Arroyo Hondo) Oak Ridge (and the diversion tunnel) and in the vicinity of Calaveras Dam.

Access to San Antonio Reservoir is provided from Vallecitos Valley. The main road is Ranch Rd., a gravel/dirt road from Vallecitos Valley along the northeast end of the reservoir, up the La Costa Valley and to San Antonio Creek and Williams Gulch. This road provides access to private lands east of SFWD lands. Other dirt roads are apparent with abandoned or alternate routes.

Some side roads extend up tributaries, including La Costa Creek, Indian Creek, and Apperson Creek. Others are routed along power transmission lines and pipeline easements crossing the watershed.

The principal road to the Alameda Creek basin is the gravel/dirt road along Alameda Creek, providing access to the diversion dam and Ohlone Regional Park. Few side roads are present, routed to the northern portion of basin's ridges.

Numerous public access roads and highways include highway 680, crossing from north to southwest through Arroyo de la Laguna and the Sunol Valley, Highway 84 crossing west and east though Niles Canyon and Vallecitos Valley and numerous county and private roads that provide access to Pleasanton, Sunol, Castlewood, Country Club, Scotts Corner, and Welsh Creek. The Valley floor is criss-crossed with internal gravel/dirt roads for access by SFWD staff and gravel mining operators.



Source: Wildland Resource Management

GIS Mapping by EDAW, Inc. - San Francisco

March 1996

Fire Defense Improvements

Scale 1 : 80,000

Feet 1000 0 2000 4000 6000

Meters 500 0 1000 2000

1" = 6667 feet

ALAMEDA WATERSHED

SAN FRANCISCO WATERSHED MANAGEMENT PLANS

2. Standards for Roads:

Standards for roads address the need for access that is adequate to meet emergency vehicle needs. While CDF's PRC 4290 regulations require 18-foot wide roads serving newly constructed residences in rural setttings, CDF's requirements for roads serving forest management have quite a different standards. For land management purposes, roads are to be planned, located constructed and maintained in a manner consistent with long-term enhancement of maintenance of the forest resources, economic feasibility, minimize damage to soil resources, and fish and wildlife habitat and prevent degradation of the quality and beneficial uses of water. Factors that are considered in the CDF's Forest Practice Rules are:

1. use of existing roads whenever feasible,
2. use of systemantic road layout patterns to minimize total mileage,
3. planned to fit topography to minimize disturbance to the natural features of the site,
4. avoidance of routes near the bottoms of steep and narrow cnayons, through marshes and wet meadows, on unstable areas, and near watercourses or near existing nesting sites of threatened and endangered bird species,
5. minimization of watercourse crossings, and
6. location road roads on natural benches, flatter slopes and areas of stable soils to minimze effects onwatercouses.

In existing road systems, it makes sense to improve the road system by installing turnouts where feasible and by following the California Forest Practice for installation and maintenance of roads. The CDF's Forest Practice Rules incorporates best management practices; these practices include such actions as listed above, and well as installing waterbreaks (also known as waterbars) and other methods (such as dips) to prevent erosion. Turnouts can be installed at reasonable intervals selected by field examination. Roads and turnouts should be no wider than necessary to provide safe passage of patrol, maintenance and firefighting equipment. A layer of wood chips can be placed on the road to aid in the prevention of erosion in winter and dust in the summer, and to help blend the road into the landscape.

3. Current Water Supply

Water supply is provided by a variety of sources but the water supply for fire suppression on both watersheds is meager. The most traditional source in urban areas is a hydrant. However, hydrants in wildland settings are a rare but appreciated occurrence. Instead, water is often drafted by water tenders from ponds, streams, cisterns, and reservoirs. More recently, helicopters with a bucket will draft from ponds and reservoirs wherever water depth is greater than 4 ft. The water tanks on the SFWD lands typically cannot be accessed via wharf valves by fire suppression resources.

Hydrants - Nine hydrants serve the Alameda Watershed, all located on the valley floors. Four are located in the Sunol Valley north of Highway 680. Three of these are located outside the SFWD land proper: one is on Kilkare Rd., one is on Foothill Rd., ad another south of the Southern Pacific right-of-way. The one hydrant in north Sunol Valley within the SFWD lands is located at the administrative offices.

A hydrant is located (along with a cottage and water tank) at the intersection of the Hetch Hetchy Aqueduct and Calaveras Rd. A hydrant is located at the facility at the mouth of Haynes Gulch.

Two hydrants are located along Geary Rd. One is on the portion of road that falls outside SFWD lands, and another is located further south along the road on SFWD lands. The southernmost hydrant is located below the Calaveras dam. No hydrants exist in the San Antonio Reservoir basin and anywhere east of Calaveras Reservoir.

Reservoirs where water can be drafted using helicopters (H/C)+/ or vehicles (V)

Reservoir Name/Location		
San Antonio Reservoir	H/C	V
Calaveras Reservoir	H/C	V

Ponds where water can be drafted using helicopters (H/C) +/or vehicles (V)

Pond Name/Location		
Gravel pits in Sunol Valley	H/C?	V
Walker Pond (near San Antonio dam)	H/C	V
Chaney Zwiggert Pond (at northern SFWD boundary along Vallecitos Rd)	H/C	V
unnamed pond south of Vallecitos Rd west of San Antonio Reservoir		V
Goldfish Pond (at southwest border near entry of Calaveras Rd on SFWD lands)	H/C	V
unnamed pond (on north side of Marsh Rd. where pavement ends)		V
Diversion Dam	H/C	
unnamed pond on La Costa Crk west of BM 929		V
unnamed pond south of San Antonio Reservoir (on the trail that connects Apperson Crk with Indian Creek)	H/C	V

Water Tanks - Most of the seven water tanks on the Alameda watershed are metal, of 10,000 gallon capacity. One is located in the north Sunol Valley north of the intersection of Paloma Way bad Foothill Blvd. In the upper reaches of San Antonio Valley there is a new tank co-located with a cabin at the corrals. At the intersection of Calaveras Rd. and Hetch Hetchy Aqueduct a tank is co-located with a cottage and hydrant. Two 10,000 gallon wooden tanks are co-located with a cottage on the northeast shore of Calaveras Reservoir. Two tanks are located along Marsh Rd., one metal 10,000 gallon tank installed for domestic use near the end of pavement and another at the mobile home near the intersection of the dirt road to the Calaveras Test Site.

4. Special Concerns/Hazards

As mentioned in the Setting, special features in the watershed either pose particular hazard or are particularly sensitive to wildfire or suppression actions. Particular hazards may be formed by buried jet fuel lines in case they ruptured, developments because they burn with considerable intensity and tend to divert suppression efforts. Power line towers may restrict use of aerial attack because they might be located in the flight patch or because they may limit the pick up of water from the potential water sources list above. Powerlines are located in the northern portion of the Sunol Valley and roughly parallels the 680 freeway. Besides powerlines, the mountain peaks themselves have been the site of crashes where aircraft pilots have misjudged their height. The moutain peaks are particularly hazardous in the eastern portion of the Watershed.

On the other hand, some areas may merit special attention in fire management planning. These include areas of steep topography, or archeological sites, where heavy equipment may cause significant soil damage. Rare and endangered species may require additional protective measures commensurate with their life requirements. The locations of these "listed" plants and animals which particularly vulnerable to this type of damage should be incorporated into pre-suppression plans and agreements with fire suppression agencies.

Because efforts to suppress a fire can also result in damage to water quality and cause increased sedimentation, a 'light hand on the land' type of suppression should be adopted throughout the watershed. This includes the rehabilitation of areas scraped bare by bulldozers to form control lines which could cause significant erosion if left unrepaired. Suppression efforts can also damage vegetation.

5. Modified Suppression Areas

Several pre-suppression plans have been prepared and agreements made with local fire protection agencies (principally CDF). Locations where the use of bulldozers are restricted are determined by topographic considerations, vegetation types, forms and species, as well as slope stability, and other factors such as identified locations of cultural resources. The types of suppression may be modified in the following ways: Suppression may be enhanced to focus on protection issues, or modified to emphasize aerial attack and suppression. Limited protection may be considered in locations where slope steepness requires special modes of suppression. EDAW has compiled maps of sensitivity based on these considerations which will guide decisions regarding appropriate suppression actions.

6. Equipment Available

SFWD Equipment - Equipment owned by the SFWD may be called upon for use during a fire emergency. Equipment may be used at the discretion of the Incident Commander (IC), and should not be mobilized until requested. However, notifying the IC of the availability and location of such equipment and operators is generally helpful. In those cases then the costs of suppression which are borne by the SFWD, use of SFWD equipment reduces the overall costs which would be charged back to SFWD from charges which results from use of equipment owned by other agencies.

CDF Equipment - Protection Resources - Fire protection is afforded by the California Department of Forestry and Fire Protection. Structural fire protection is also provided by this same organization year-round. This organization will also respond to other emergencies (such as vehicular accidents, or medical emergencies). On the Alameda Watershed the nearest station is the Sunshine Station, on the northern border of SFWD lands in Sunol, not far from the SFWD administrative offices. Even so, response times from these station to interior portions of the watershed are delayed by the narrow and curving nature of the road within the watershed. The stations are equipped with wildland fire protection engines, and are otherwise equipped to tender structural fire protection.

The nearest airborne resource is Helicopter 106, based near the Lexington Reservoir off Highway 17, Santa Clara, CA. This helicopter will provide initial attack as well as extended suppression.

Mutual aid availability - Under a mutual aid agreement a greater number and type of fire suppression resources are available from nearby fire departments such as the Alameda County Fire Department, Lawrence Livermore National Laboratory, Milpitas Fire Department, Central Fire Department, Spring Valley Structural Fire Protection District, and East Bay Regional Park District Fire Department.

C. PROJECT LIST TO ENHANCE SUPPRESSION

1. Water Supply

Because of the relative inaccessibility of water supplies for fire suppression on the watersheds, a variety of improvements to water supply are recommended. They generally are in the form of dry hydrants off reservoirs, creeks, ponds, and springs, and in heliports on ridgetops with associated water supply. Additionally, some modifications to tank valves to allow access at the tanks are also recommended. The locations of the various recommended improvements are shown on the attached map.

Dry Hydrants - Installation of dry hydrants into nearby reservoirs or other water sources reduces the complexity of long-distance water shuttle operations. Dry hydrants also provide access to water sources from a roadway rather than having to work on soft ground immediately adjacent to the pond or stream.

A dry hydrant consists of an arrangement of piping with one end in the water and the other end extending to dry land and available for connection to a pumper. Dry hydrants have a non-pressurized pipe system, comprised on relatively inexpensive materials. They are permanently installed (with minimal maintenance) in lakes, ponds, streams or cisterns, and provide access to water in all weather conditions.

A total of 9 dry hydrants are proposed on the Alameda Watershed. The location of these follow:
1. Intersection of Sections 28, 29, 32 & 33 on Arroyo Hondo
2. Section 30 south of eastern arm of the Calaveras Reservoir, on access rd.
3. Near Goldfish pond, where Calaveras Rd. enters SFWD land from southwest
4. In western half of Sect. 18 near Ridge Rd.
5. In Section 17 near the Diversion Dam
6. Along La Costa Crk south of the Hetch Hetchy Aqueduct east of BM 929
7. Along the dirt road that connects Indian Creek and Apperson Crk. south of San Antonio Reservoir
8. At the Cottage at the spillway of San Antonio Reservoir
9. East of Calaveras Rd., in the first drainage north of Hetch Hetchy Reservoir at approximately 900 ft elevation.

Heliports - As used here, heliports includes 2 acres of paved area with a catchment with asphalt berms, collection basin of approximately 10,000 gallons from which water can be drafted.

In the Alameda Watershed, a total of 4 heliports are proposed on SFWD lands:
1. In Section 27 on Weller Rd. at 1800 ft elevation*
2. In Section 10 east of Mission Peak on access road to southern fork of Mill Creek Rd., at 1680 elevation*
3. In Section 23 in Williams Gulch on access road as I enters and leaves SFWD northeastern boundary at 2000 ft elevation*

4. In Section 27 west of Arroyo Hondo on Hades Ridge, at BM 3117

In addition, 3 more heliports are proposed off SFWD lands:

1. In Section 11, on Valpe Ridge on Rose Peak, VABM 3817
2. In Section 2, on Wauhab Ridge, at a local peak of 3223 ft elevation
3. In Section 6 (off SFWD lands) on EBRPD lands on the southern fork of Welsh Creek Rd. at a local peak of 2030 ft elevation*

* *indicates heliport is adjacent to an access road*

Hydrants - Four additional hydrants are proposed.

1. Section 3 near the southern intersection of Geary Rd. and Calaveras Rd.
2. At Calaveras Test Site
3. At northeast border of SFWD lands along Vallecitos Rd. northwest of Chevron facility
4. Where jeep trail and Sunol Aqueduct intersection north of Sunol Valley Golf Courses

Water Tanks - One 10,000 gallon metal water tank and one hydrant is proposed to be co-located in the southwest corner of Sect 3 where the jeep trail runs up to Poverty Ridge.

2. Access

Changes to access network will include addition of turnouts, turnarounds and safety zones as topography and soil characteristics permit. The exact location will need to be determined in the field. Occasionally, a new access route will be created to serve plan implementation needs. Some management roads may not be suitable for continuous access however provides a route for treatments. Examples of such access route may be those installed to maintain power line tower bases. The routes may grow in between uses, and need not be maintained to the same level as other more formal roads and trails.

IV. FUEL MANAGEMENT PLAN

A. OBJECTIVES, PRIORITIES, AND STRATEGIES

To a fire, all vegetation and structures are fuels. The nature of vegetation is that it is dynamic, continually growing and proceeding through senescence. Because of this factor, fuel management is an ongoing task. The vast majority of ecosystems in California have evolved with disturbance which removed fuel build-up. While fire suppression has obvious benefits to protection of improvements, the management of vegetation, particularly for fire hazard reduction is an important input to the ecosystem which must be done, and done under controlled circumstances. Because of the accrual of several decades of vegetative fuel (particularly on the Peninsula Watershed), initial projects will be a much larger task than ongoing maintenance; it can be anticipated the implementation of the initial 10-year period will be substantial. After the implementation of initial projects, maintenance will be an on-going facet of watershed operations, much like maintenance of roads after they are built.

1. Fuel Management Objectives

A. Reduce ignitions
B. Minimize surface fire spread/Compartmentalize fires
C. Reduce/Minimize fire intensity
    1. Within watershed
    2. Along borders by developments
D. Reduce ember production or distance embers are cast
    1. Along borders

Objective	Action
Reduce ignitions	Modify behavior (signage, restriction, closure) Manage fuels (mow, disk, irrigate, rake, convert)
Compartmentalize fires	Increase detection, reporting, access Manage fuels (install fuelbreaks, roadside clearing)
Reduce fire intensity	Increase water supply Manage fuels (prescribe burn, thin, salvage operations, prune, convert)
Reduce spotting potential	Manage fuels (prescribe burn, thin, salvage operations, prune, convert)

2. Priorities

The following areas are highest in priority for treatment.

- areas next to developments/improvements/sensitive areas
- major egress and emergency ingress routes
- areas of crown fire potential
- potential and existing fuelbreaks

3. Strategies In Areas Of Fuel Management

Strategy: Reduce fuel volumes
Recommendations:

- remove deadwood from trees and shrubs
- thin forest stands that produce great amounts of litter and debris
- create shrub islands from continuous shrub masses
- remove shrubs from beneath and around existing and emerging trees
- select low-growing shrubs and ground covers as replacement plants
- remove/reduce plant litter accumulations, especially large debris such as branches
  - can replace with small particle mulch to prevent invasion of noxious weeds

Strategy: Reduce fuel flammability - i.e. reduce the ability to ignite
Recommendation:

- mow grass as it cures (typically once a year, usually from May to June)
- replace annual grass with perennial plants which do not dry (or cure)
  - usually a mowable/rake-able ground cover is needed under trees
  - a low fuel volume shrub is sometimes acceptable
  - perennial grasses have other benefits
    - they are native species rather than alien
    - perennial grasses allow for staggered or phased mowing regime
    - they often provide preferred forage
- establish a formal irrigated landscape in carefully selected areas
- remove sick and dead shrubs and trees in a timely manner

Strategy: Establish/maintain fuel discontinuity -i.e. create/maintain spaces between fuels
Recommendations:

- remove/reduce "ladder" fuels
- create shrub islands from continuous masses
- remove shrubs from beneath and around existing and emerging trees
- create low fuel zone near in especially vulnerable/sensitive areas

Strategy: Reduce the possibility of fire traveling through tree crown - i.e. keep fire from burning entire trees, but rather keep fire spread on the forest floor only
Recommendations:

- Thin flammable tree stands (pine and eucalyptus) to open canopy structure
- Prune lower branches larger than 3 inches in diameter to 10 ft above ground
- Perform fuel volume reduction actions mentioned above

B. FUEL MANAGEMENT STANDARDS

A variety of treatments can reduce the hazard of damage from wildfires. The prescription standards are used as a base for fire hazard reduction recommendations on SFWD lands. Most of the actions can be applied with little or no modification. However, where these actions are to be modified, they will be specified. The site specific recommendations that follow also annotate how actions may be modified in any one circumstance.

These standards/prescriptions were initially developed by Amphion, Inc. for use by the FEMA-funded East Bay Hills Vegetation Management Consortium (VMC). These standards/prescriptions have been reviewed and adopted by the following agencies in the consortium: Cities of Berkeley, Oakland and Piedmont, East Bay Municipal Utility District, East Bay Regional Park District, University of California, Lawrence Berkeley Laboratory, and PG&E. As part of the review process, a Citizen's Advisory Committee and a Technical Advisory Committee, which were comprised by a cross-section of members of the public reviewed and commented on the standards.

The standards consider wildlife habitat management, biodiversity, aesthetics, soil stability, and other factors which help determine the optimum treatment of vegetation.

The standards/prescriptions have been modified and customized to fit the specific circumstances on the San Francisco Water Department lands.

The treatment prescriptions are organized by groupings of vegetation types:

Grasslands
North Coastal Scrub
Successional Scrub
Chaparral
Mature Eucalyptus Forest
Pine Forest
Mixed Evergreen Forest and Oak Woodland
Douglas-Fir Forest
Redwood Forest
Riparian Forest

For each vegetation type, the resulting fuel bed characteristics after treatment have been described and modeled. This was done as part of the VMC plan development. Thus, fire behavior can be modeled after treatment.

In addition, a set of guidelines for creation and maintenance of a fire safe area (defensible space) around residences and other improvements are recommended. Lastly, a set of guidelines for any new construction (residences in particular) are suggested.

1. Prescription for Grasslands

- Mow or, on Alameda, graze to 4 inches in height, or 1000 lbs of RDM (residual dry matter)
- Mow or, on Alameda, graze to 4 inches in height (or 1000 lbs RDM) for a width of 10 ft from roadsides
- Native grasses should be mowed to a height no shorter than 4 inches and may be mowed later in year to accommodate seed ripening and shatter
- Around improvements, mow for a width of 30 ft on slopes <20%, 50-100 ft on slopes >20%
- Maintain brush cover <30%, <20% where slope steepness >20%

⇒ Requires annual treatment, usually requiring treatment of all grass within 2 wks

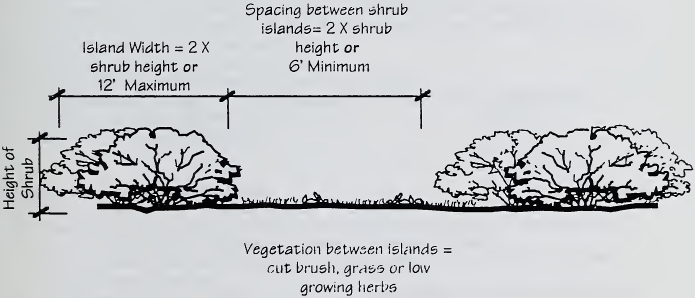
2. Prescription for North Coastal Scrub

- Create islands of <12 ft in diameter or 2xs the height of tallest shrub (whichever is smaller). Create clumps that are natural in appearance including specimens of variable age classes
- Within 100 ft of improvements, grass between shrub islands should be mowed when cured
- Distance between islands shall be greater than 2xs the height of tallest shrub or a minimum of 8 ft, whichever is greater
- Retain between 30-40 percent of brush areas in brush crown cover
- The removal of brush should be based on criteria which are listed in approximate order of importance to fuel management objectives:

⇒ relative flammability - remove the most flammable species first.

Island Spacing for Shrubby Fuels

Untreated Shrubs


Spacing between shrub islands= 2 X shrub height or 6' Minimum
Island Width = 2 X shrub height or 12' Maximum
Height of Shrub
Vegetation between islands = cut brush, grass or low growing herbs

Treated Shrubs

⇒ plant vigor - remove shrubs of low vigor, dying or dead shrubs

⇒ sprouting capability - remove species with sprouting capacity first

⇒ effects of plant species on soils - i.e. retain shrubs with slope-holding capacity, that increase soil nutrients (ceanothus)

⇒ value for wildlife food and cover

⇒ aesthetic values

⇒ For example, priority for removal follows

a) chamise
b) coyote bush
c) poison oak
d) blackberry
e) northern sticky monkey flower
f) coastal sage brush
g) scrub oak
h) manzanita
i) thimbleberry, salmonberry
j) wild currant

⇒ Remove only if necessary

k) coffeeberry
l) buckeye
m) ceanothus
n) bush lupine
o) madrone
p) toyon
q) coast live oak

⇒ The order of priority will change according to local conditions such as the relative abundance of each species. For example, where coffeeberry is not abundant, it may be placed high in priority to retain. Attempts should be made to maintain diversity of species.

- Maintain a crown cover of less than 30%
- Can convert to grass, especially in fuelbreaks
- Maintain less than 20% dead material in the shrub canopy
- Protect oak, madrone, buckeye and trees under 6 ft in height. Cut out shrubs below driplines and within 6 ft from edge of tree canopy

⇒ Anticipate 5-7 year treatment cycle

3. Prescription for Successional Scrub

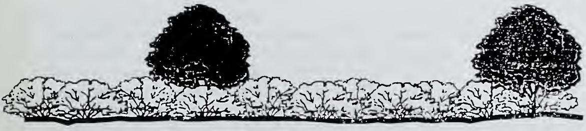
- Follow prescriptions for north coastal scrub where trees do not exist
- Protect tree specimens and encourage development for canopy closure. For trees over 8 ft tall, cut out shrubs below driplines and within 6 ft from edge of canopy
- Mulch or permit grass (which may be grazed [on Alameda] or mowed) to provide cover between islands and trees
- Protect oaks under 6 ft in height. Prune up to a maximum of 1/3 height of trees that are not taller than 24 ft tall

⇒ Anticipate initial treatment most significant operation, with annual mowing of grass between islands, and a treatment cycle of 5-7 years to maintain shrub islands in tree-less areas, and 3-5 years to maintain spaces surrounding emerging trees. As trees canopies touch (within 10 years in most cases), maintenance requirements dramatically decline.

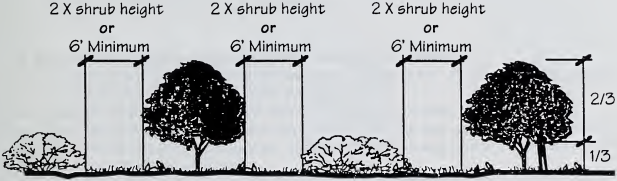
4. Prescription for Chaparral

- Create islands of <8 ft in diameter or 2xs the height of tallest shrub (whichever is smaller). Create clumps that are natural in appearance including specimens of variable age classes
- Grass between shrub islands should be mowed when cured
- Distance between islands shall be greater than 2xs the height of tallest shrub or a minimum of 6 ft, whichever is greater
- Preferentially remove flammable sprouting species such as chamise and some manzanitas. Keep less flammable sprouting species such as oak, and coffeeberry. Keep species which require seed for reproduction such as ceanothus.
- Maintain a crown cover of less than 30%

Treatment of Emerging Oaks



Untreated Shrubs with Emerging Oaks



Prune up lower
1/3 of tree
height or 8'
maximum

Vegetation between shrubs & emerging oaks =
cut brush, grass or low growing herbs

Treated Shrubs with Emerging Oaks

- Can convert to grass where site allows
- Maintain less than 20% dead material in the shrub canopy
- Protect oak trees under 6 ft in height

⇒ Anticipate 5-7 year treatment cycle

5. Prescription for Eucalyptus Forest

- Can remove to restore to native vegetation. Control resprout of cut stumps.
- Provide 10 ft vertical clearance to remain as mature eucalyptus
- Remove loose bark up to 10 ft above ground
- Remove understory and tall shrubs
- Maintain less than 9 tons/acre in fuel volume on the forest floor
- Mulch forest floor with mulch (not eucalyptus leaf litter) of a 2 in maximum depth

- Thin to less than original spacing (12 ft X 12 ft?)
- Remove all trees under 20 inches dia
- Control resprout of cut stumps
- Control and eliminate all suckering
- Remove all material less than 4 inches in diameter, cut material greater than 4 inches in diameter into firewood

⇒ Anticipate 2-3 year cycle to maintain standards.

6. Prescription for Mixed Evergreen Forests and Oak Woodlands

- Prune branches up to 3 inches in diameter for a height of 8 ft. Prune up to a maximum of 1/3 height of trees that are not taller than 24 ft tall
- Maintain under 5 tons/acre, with duff no deeper than 3 inches
- Leave all trees bigger than 8 inches dia. Leave 1/3 of the trees under 8 inches to retain a range of size categories and species. Maintain a stand density of less than 50 trees per acre as long as canopy is still closed.
- Can mulch site to a maximum depth of 2 inches to prevent invasion of noxious weeds

⇒ Treatment cycle is from 7-10 years

7. Prescription for Riparian Forest

Avoid treatment. Where necessary:

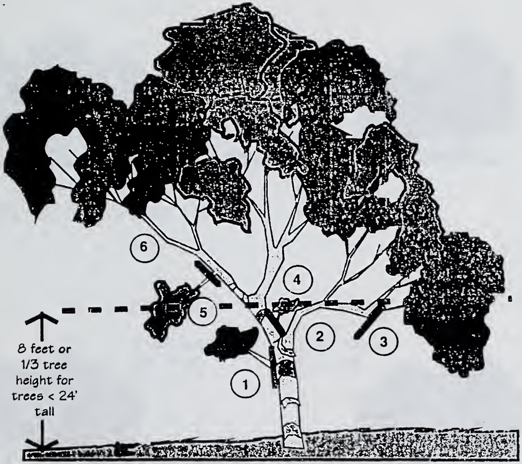
- Create or maintain an 8 ft vertical clearance between live needles and understory fuel. Remove all dead material. Prune branches up to 3 inches in diameter. Prune up to a maximum of 1/3 height for trees not taller than 24 ft in height.
- Maintain under 10 ton/ac. Depth of duff no greater than 5 inches
- Mulch depth between 2 and 5 inches in depth

⇒ Treatment cycle in redwood forests are between 10-15 years

8. Defensible Space Guidelines

Residents will be responsible for maintaining a 100 ft wide defensible space on all sides from the residence. Other structures will be similarly maintained by SFWD staff. All dead plants and combustible materials shall be removed within 100 ft of each structure to establish and maintain a defensible space. This includes those areas adjacent to driveways and along fence lines. Removal of combustible materials includes, but is not limited to, the following actions:

Tree Pruning Guidelines for Defensible Space & Fuel Modification Areas



Tree pruning for proper clearance between ground and branches

Key to Pruning Diagram

① *The stem with foliage attached is below 8 feet so would be cut at the junction with the tree trunk.*

② *The branch even though it is under 8 foot in height, does not have any foliage directly attached below the 8 foot height, so would be left.*

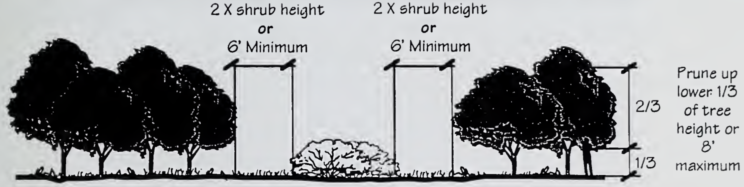
③ ④ *These stems with foliage are under 8 feet, so would be cut at the junction with the tree.*

⑤ *The branch bends below 8 feet in height and so would be cut at the split*

⑥ *This stem is higher than 8 feet and so would be left.*

Understory Clearing

Untreated Shrubs under Oaks



Vegetation under oaks and between shrub islands = cut brush, grass or low growing herbs

Treated Shrubs under Oaks

a. Cut grass and weeds to less than 4 inches. Cutting of native grass and wildflowers may be delayed until after seed set unless they form a means of rapidly spreading fire to any structures.

b. Remove all dead plant material from within 100 ft of each structure. This includes maintaining the ground, roofs, decking or balconies free of dead leaves, needles or other plant debris. This also includes removing from trees loose papery bark, and dead branches smaller than 3 inches in diameter, to 8 ft above ground. Remove all dead branches from within live ground covers, vines and shrubs. Refer to Figure X explaining pruning

c. All live vines and live branches smaller than 3 inches in diameter shall be cut up to a height of 8 ft above ground. Refer to Figure X explaining pruning.

d. Remove plants as necessary to break vertical continuity between shrubs or ground covers, and trees, decks or overhangs on buildings. Vertical separation is the distance from the top of shrubs or ground cover to adjacent trees, designed to minimize the spread of fire to the crown of trees or structure roofs. Vertical spacing should be a minimum of 8 ft or 2 times the height of the understory plants to the leaves or needles of adjacent overstory trees, decks of overhangs, which ever provides greater separation. For overstory trees under 24 ft in height the minimum clearance can be reduced to 1/3 of the overall height of the overstory tree provided this reduced clearance does not form a means of rapid transmission of fire.

e. Remove all branches within 10 ft of any chimney or stovepipe including chimneys on adjacent properties

f. Chipped materials can remain on the site provided the chipped mulch layer is no greater than 2 inches in depth.

C. DESCRIPTION OF METHODS AVAILABLE

These descriptions were initially compiled by Amphion, Inc. for use by the East Bay Hills Vegetation Management Consortium. These descriptions are based on project experience in the Bay Area, including the plan prepared for the Marin Municipal Water District, University of California at Berkeley, and the City of Hercules.

1. Hand Labor

Description: Hand labor involves pruning, cutting or removal of weeds or shrubs by hand or using hand-held equipment. This process is slow and expensive, but most selective and has little impact beyond the removal of the target plants. This technique generates considerable debris when pulling, pruning and cutting vegetation. The debris is not always removed from the site due to the high cost of doing both the clearance and removal by hand. This method is most commonly used by residents to reduce fuel volume on private lands, or Sheriff Inmate Crew to reduce hazard adjacent to improvements. *The hand labor encompasses tree removal, pruning, bark pulling, removal of dead wood, litter removal and mulching, mowing, and establishing new plant material.*

Specialized techniques include:

¥ *Weed whipping:* This technique uses a hand-held tool (normally gas powered) that cuts grass and very small shrubs with a fishing-line type of cutter (or cutting blade). The treatment should be used annually after the grass has dried or cured (so the grass does not grow back). The mower reduces the height of the fuel, but does not create areas of bare soil (fuel remains continuous but lower). Weed whipping is often the only type of "mowing" treatment possible in steep wooded areas or landscaped slopes. Heavier machines can be fitted with plastic or steel knives or serrated saw blades (brush cutters or brush saws.) Utilizing a cutting blade allows the mulching of cuttings in a single process, but is limited to pieces under 1" diameter in size. Production rate is approximately 50 feet an hour if the strip is 15 feet wide.

¥ Vista Pruning: This entails removal of under-story shrubs, small trees and lower limbs of trees up to a height of 10 feet to create a vertical separation (discontinuity) between surface fuel and tree canopy. The materials may need to be re-cut to make them smaller if debris is not removed from the site. This method lowers ignitability, decreases the available fuel and heat output (which reduces the potential for fires moving from the surface to crown, and decreases spotting potential). The removal of dead materials has the net result of increasing fuel moisture with a higher proportion of new lush growth in subsequent years. Vista pruning also reduces the amount of smaller material in the understory decreasing the availability of fine fuels to carry a fire into larger fuels. The production rate varies depending on density and type of vegetation removed. Requirements for cutting materials into smaller size or piling for burns add to overall production time.

¥ *Machetes*: This technique uses machetes to beat down the branches of chaparral and break off the brittle materials. The fallen branches are then broken into a compact mulch. Pointed stems left behind may be unsafe in areas highly used by the general public.

Manpower/Equipment required: Available crews include water department staff, private firms, volunteers, and subsidized labor forces such as Sheriff's Work Furlough and Inmate hand crews, East Bay Conservation Corps, California Conservation Corps, and the California Youth Authority. The required expertise and manual skills vary depending upon the materials treated and equipment required. Supervision and adequate training is required to ensure desired results. Hand tools include shovel, Pulaski hoe, McLeod, weed whip and "weed wrench" (a tool that pulls the shrub and root system), chain saw, hand saws, machete, pruning shears and loppers. Chippers are often used in conjunction with hand labor to process the cut materials.

Application: Hand labor is the most flexible technique and best suited to spot applications on small areas, with difficult access, and those areas with sensitive environmental considerations where other methods are not suitable. The technique is often used in combination with the following other management techniques in order to remove (or reduce the hazard of) the debris:
¥ Scattering of debris. Where neither hauling or burning are feasible, material may be cut into short lengths less than 3 feet long and scattered on the site. The trimmings can be woven into small check dams or be used as mats to reduce surface water flow in locations where soil erosion is evident.
¥ Mechanical treatments such as chipping to reduce size of the cut debris. These chipped materials may then be redistributed as a layer of mulch over the treated area.
¥ Prescribed burning of the materials that have been arranged in piles (pile burns) to remove the debris or burned in a stationary fire(much like a fireplace).

Timing considerations: Work is usually staggered throughout the growing season, keyed to a specific stage of plant growth. Weed whipping to reduce fuel height should be done after the grass has cured. Pruning of dead materials can be done almost any time of year. Pruning of live materials needs to be timed depending upon species and desired effect -- later summer/early fall will have more long lasting results. Power equipment should not be used during extreme fire weather for fear of ignitions.

Treatment Life-cycle: Repetition of treatment varies depending upon specific target materials.
¥ Removal of weeds is required on an annual basis. Timing is critical to removal. If annual materials are removed too early they will continue to grow and defeat the management action. In some materials the cut green material will decompose and subsequent growth will be thinned considerably. If undesirable material is removed too late, seeds already may have been produced and may be distributed to nearby disturbed sites. (This technique may serve as a distribution method of desirable seed, if timed appropriately.)
¥ Shrub pruning or removal cycles depend upon species and treatment standards with acceptable time between treatments varying from annual to every three to five years.
¥ Tree pruning is the most long-lived with a potential interval as long as 10 years. 5 years is a typical optimum treatment cycle.

Relative cost: Among the most expensive technique if commercially contracted (i.e. if volunteer or subsidized labor are not utilized). Production rates and expertise of crews are extremely variable.

Limiting Factors:
¥ Poison Oak may restrict access in many areas. Many crews will not work in Poison Oak areas.
¥ Size of area to be treated and availability of manpower

Advantages
Most selective technique
Possible to use in most physical conditions (steep slopes, wet ground, among trees)
Relatively quiet
Least amount of soil disturbance

Disadvantages
Expense
Slow
Requires follow up treatment to remove brush from site. Dead material is highly flammable until removed, burned or decomposed.
Scheduling, orienting & supervising required
Cannot be used effectively in heavy poison oak
Effectiveness is short term

2. Tree Removal

Description: Tree removal varies from cutting of individual trees, thinning a thickly stocked stand, to removal of entire overstory canopy. This process can be slow and expensive, but can be selective with limited impact beyond the removal of the target plants (depending upon scale of removal). Sometimes harvesting techniques, particularly those which employ a feller-buncher, can be quite rapid. If the whole tree is not harvested, the technique generates considerable debris (from tree branches) that should be removed using either machinery or horses to haul. There is currently some local interest in commercial harvesting, especially of Eucalyptus, for use in co-generation or pulp products. Douglas fir has the highest commercial value, with larger diameter trees available for use as lumber. Other trees may also be used for co-generation or pulp products. Pine has commercial value and may be removed for a relatively low cost by commercial loggers provided the condition, access and number of trees meet their requirements. A portion of debris may be left as a sort of erosion control measure and to cover bare spots. The boles of trees and other debris should be hauled away or may be burned later as a part of a prescribed burn (pile or broadcast).

By removing the trees their canopy no longer contributes to a fire in the form of a crown fire or ember production. Additionally the production of surface fuels is reduced since biomass production (branches, leaves, duff etc.) is decreased. This technique has positive impact on reducing spotting potential, heat output, spread rate and potentially ignitability depending upon what replaces the overstory. Specialized techniques include:

¥ *Stand Density Reduction*: This technique focuses on removal of selected trees to reduce the overall number of trees in a forest stand. Targeted trees can include those damaged by frost, disease or pests, or old age and well as re-sprouts or young shrubby trees. This is especially useful where the density creates the potential for canopy fires or where vertical continuity of fuels is created by the clumped arrangement of different sizes of trees. This technique is also appropriate where a sheltered fuel break is to be established.

¥ *Overstory removal*: At the extreme this technique includes complete removal of the overstory trees. This technique is appropriate where a fuel break is to be established or along roadside clearance.

¥ Sprout removal is often required as a follow up treatment. No one treatment has been proven 100% effective to prevent resprout of Eucalyptus. A mixture and combination of treatments scheduled over three years is the best approach with records regarding effectiveness and costs of various treatments can be compared. Methods that have been used in the past include:

¥ application of herbicide (such as glyphosate or Garlon 4a) applied to stump within five minutes after cutting

¥ cutting the stump to "frill" the cambium layer and then applying herbicide to outside of cambial layer.

¥ piling slash on stumps and burning the pile at a later date (fires in stumps and roots are very difficult to monitor and put out).

¥ manually removing regrowth on a repeated basis

¥ spraying of regrowths less than 4 feet tall with glyphosate or Garlon 4a.

¥ placing ditch liners over the stump and leaving in place for several years.

¥ grinding out the entire stump

Manpower/Equipment required: Available crews include watershed management staff, and private firms. The technique requires expertise and a high level of manual skills, including use of equipment, climbing or bucket work, or handling of draft horses.

Application: Removal of debris is critical to the success of tree removal. The technique is often used in combination with the following other management techniques:
¥ Hauling of felled trees using horses or machinery to a location where materials can be chipped, cut for firewood or trucked from site.
¥ Mechanical treatments such as chipping to reduce size of the cut debris. These chipped materials may then be redistributed as a layer of mulch over the treated area.
¥ Prescribed burning of the materials that have been arranged in piles (pile burns) to remove the debris.

Timing considerations: Work is usually staggered throughout the dry season. Tree preservation ordinances or environmental concerns may dictate notification and review process and may impact timing of operations. Winter work may be limited by stability of haul routes, surface erosion concerns and soil compaction concerns.

Treatment Life-cycle: Repetition of treatment varies depending upon specific target materials.
¥ Tree removal may require subsequent treatments of stumps to prevent resprouting depending on species (multiple treatments of re-sprouts are often required).
¥ Overstory removal creates patches of disturbance by the removal operation. Subsequent treatment of the area is dependent upon the species that encroach into these patches. Removal of exotics or weed species on an annual bases should be anticipated until an acceptable stable vegetation type is re-established.

Relative cost:
¥ Horse logger can complete approximately 1/3 acre per day depending upon haul distances. Cost is approximately $3,000 to $5,000 per acre.
¥ This can be the most cost effective treatment if wood fiber can be sold commercially -- otherwise cost can total over $5,000 per acre.

Limiting Factors:
¥ Political and social acceptance of tree removal. Tree preservation ordinances may require public review process in some cities
¥ Topography and wet ground may limit access to tree and limit options for hauling felled material.
¥ Concerns for surface erosion and deeper slope stability may limit timing of operation and removal of overstory. Care needs to ensure that reduction of root systems does not produce deep earth movement. Potential concern over wind-throw is applicable to shallow rooted species such as Eucalyptus and Pine.

Advantages
Selective technique
An efficient technique that reduces overall spotting potential
Critical for vegetation conversion
cost effective over time
Potential for commercial value

Disadvantages
Expense
Requires follow up treatment to remove debris from site. Dead material is highly flammable until removed, burned or decomposed.
Scheduling, orienting & supervising required
Physical conditions may restrict steep slopes, wet ground, among other trees)
May create erosion or deeper slope instability.

3. Mechanical Treatments

Description: Mechanical treatments involves cutting grasses, removal of weeds, shrubs, and small trees with use of tractor or other machinery such as the Unimog and includes such operations as grading, mowing, disking, and crushing. This process is good for larger areas and has been used traditionally to establish fuel breaks, but is not very selective and may have impact beyond the removal of the target plants since it has limited maneuverability. These techniques rip up, flail or cut down the vegetation, rearranges the fuel structure and compacts the debris. The specific equipment or attachments can either beat up or cut the vegetation into small pieces, bury the pieces or rip the plants out of the ground and arrange it into piles where they can be burned or otherwise removed. Specialize techniques include:

¥ *Grading*: This technique is often used to maintain fire trails through wildlands. A tractor with blade can effectively produce a firebreak 8 to 12 feet wide which is bare of fuel. Treatment usually done in the spring after the ground is fairly dry but before grass is entirely cured (so that a fire cannot occur before the scraping is done). Site application needs to account for disturbance of water drainage pattern where the banks on the sides of the grading lands interrupt cross-slope water travel outside the land and may accelerate water travel inside the graded lane. Timing of grading is critical as annual mid-summer scraping tends to sow weed seeds of species that may be serious fire hazards. The disturbance created by annually graded fire trails can result in excellent establishment sites for weed species.

¥ *Mowing*: Mowing using a tractor or Unimog with a mower attachment (rotary or flail mower) reduces the fuel height and thus the rate of spread in a grass fire. Once equipment is on site, production rate can be 5 acres a day. Timing of mowing has an impact on the type of grasses promoted -- late mowing after annual grasses have cured enhances growing conditions for perennial native grasses (provided mowing is not during seed production). Mowing at the right time to the right height minimizes weed and brush encroachment and reduces the amount of manual work needed to maintain the site. Mowing should be avoided when birds are actively ground nesting in the area. Mowing may be used in conjunction with other techniques such as disking requiring a thinner strip of disked area.

Roadside mowing: This includes mowing the grass, thinning or removing trees for a distance of 30 to 100 feet from the road, or removing/pruning overhanging branches. Mechanical equipment (such as a Unimog or tiger mower) can be used to mow or cut the roadside vegetation with a mechanical tree-cutting machine called a feller-buncher used to cut trees with maximum control in the placement of the cut tree. Equipment with an articulated arm has the advantage of keeping the machinery off of steep banks. Hand labor is required to prune and thin vegetation where specimens are left.

¥ *Disking*: Fuel treatment along the perimeter of open space, ranches and roadways, also known as cultivating. Rate of production quite high -- normally done by contractor who can disk land parcels of two acres or less within one day. Disking is normally performed annually once grass has cured (so the grass will not grow back that season). Tractor with disker attachment can typically cultivate a swatch 15 feet wide in a single pass. Resulting area is an uneven surface that reduces water flow across surface and by design creates an area with discontinuous fuel with many bare spots. While this is an effective barrier to surface fire spread, it is also an ideal disturbed area with prime growing conditions for weeds and distribution of their seeds. Surface erosion can be significant in areas prone to this process.

¥ *Crushing or mowing brush:* Crushing methods are usually done by a tractor or Unimog with a blade that is kept slightly off the ground. A variety of attachments include rollers (called a brush hog), a horizontal cutting blade (that operates similar to a large mower) or a set of chains to flail the material. The blade cuts or breaks off the brush top, knocks down the larger shrubs and compacts the material which is left to dry so that it can be subsequently burned. The brush that is older or dead is more brittle and breaks more easily than the thin, young stems which are easily bent. The soil surface is disturbed slightly where the tractor travels, and where

some shrubs are uprooted, however the surface is not scraped. (Tiger mower trials in Oakland have indicated chaparral removal at a rate of 12 hours per acre.)

Other attachments have been developed that use a gravity roller to crush and chops vegetation. The attachment is held by cables that can be rolled down and winched up the hillside allowing for some degree of aiming by use of the two cable on each end. the gravity roller is filled with water to provide the weight necessary to cut the brush; the cutting surfaces are arranged on the roller to resemble tire tread. An advantage to this device is that the tractor remains stationary and the roller is the only part of the machinery that moves. This device is not widely used so production rates are not yet available.

There are other large pieces of machinery (such as the' Brushbuster') which are available for contract work.

¥ *Chipping or Mulching*: This mechanical technique sometimes is used subsequent to other removal techniques and actually reduces the size of materials by feeding materials up to 4" in diameter through a chipper. The small materials produced may then be removed from the site or redistributed as mulch. The mulch layer should be kept to less than 4 inches deep. Natural compaction of this layer presents a fuel structure that is less likely to ignite. The layer also serves to reduce weed growth by presenting an inhospitable seed bed. (Logs greater than 4" should be cut for firewood or other commercial use and hauled away.)

Manpower/Equipment required: Manpower and equipment is usually only available by private contractor. Supervision and specialized training is required to ensure desired results and minimize undesired impacts. Several other agencies own specialized equipment and have the staff trained in its operation.

¥ For example, a Tiger Mower with articulated arm with a 16 foot reach two attachments include a 50" flail mower for grass and a 70" rotary cutter for cutting chaparral and small trees, chippers. Other equipment includes a Brush hog such as that owned by the EBRPD. This agency also has a Tiger Mower (with 48" rotary).

Application: Mechanical treatments must be carefully matched to the selected site's topography, access, environmental resources and vegetation type. The technique is often used in combination with other management techniques:

¥ Manual treatments, especially prior to chipping or to thin overstory on fire roads.

¥ Prescribed burning of the materials that have been crushed or knocked down to remove the debris (broadcast burns) .

Timing Considerations: Timing is critical for many of the mechanical applications; see individual techniques. Power equipment should not be used during extreme fire weather for fear of ignitions, nor during wet weather if the site has erosion and slope stability concerns if the machine travels off-road (if on road wet weather need not limit operations). Avoid use of mechanical equipment when birds are actively ground nesting in the area.

Treatment Life-cycle: Repetition of treatment varies depending upon specific target materials.

¥ Mowing or disking of weeds required on an annual basis.

¥ Grading of fire roads or fire breaks required on an annual basis. Some areas may only require grading in certain locations if the trail or road is used frequently or its surface treated (such as paved or oiled). Banks or berms that develop on each side of graded lanes should be blended back into the hillside on a 3 to 5 year cycle.

¥ Shrub crushing or removal cycles depend upon species and treatment standards with acceptable time between treatments varying from three to five years.

Relative cost:

¥ Cost for machinery is approximately $500 per day for a contracted service. Machinery can modify 1/2 acre and hour or four acres per day (provided there are no machinery breakdowns).

Limiting Factors:

¥ Most equipment cannot perform well on vertical slopes over 30%. The FMC Link can perform on slopes up to 40%. The Unimog and SHAR 20 can perform on slopes up to 50%. Mowing equipment does not perform well on irregular terrain.

¥ Maneuverability limits use within stands of trees such as Eucalyptus, Redwood or Oak/Bay Woodlands. Selectivity of treatment of individual plants limited.

¥ Weight of equipment (7 to 20 tons), vibration and scraping of soil limits its use on geologically unstable areas where soils or slopes are susceptible to landsliding or excessive soil compaction.

¥ Concern over distribution of exotic seeds by machinery tracts may require frequent wheel /tract washing to control seed dispersal.

Advantages	*Disadvantages*
Some species may benefit by mowing of habitat.	Grading can disturb natural soil profiles and water drainage patterns
Effective in large areas with relatively flat slopes	Mid-summer grading may sow weed seeds such as yellow star thistle, mustard and Italian thistle.
Can be used effectively in poison oak or blackberries	Mowing or disking may impact ground nesting birds or burrowing animals depending upon timing and standards.
Minimal health hazard	Required operator training, scheduling, orienting & supervising required
Time effective roadside treatment	Effectiveness is short term
Fast production rates	Noise associated with machinery
Fairly cost effective for large sites	Mobilization, access & maintenance associated with equipment
	Not suitable for steep terrain, rocky or forested areas, easily compacted moist or unstable soils

4. Prescribed Burning

Description: Prescribed burning reintroduces fire into the ecosystem as a "natural treatment" and can closely approximate the forces that have shaped the natural vegetation. Burning reduces the volume of fuel through combustion. Burning is conducted under specific regulations when conditions permit both adequate combustion and control. The technique can be used to burn piles of cut brush or grass (pile burns), or over a designated prepared area (broadcast burn). Prescribed burning requires the development and approval of a prescription or burn plan usually developed by the local fire protection district. The California Department of Forestry and Fire Protection (CDF) sponsors a program for conducting prescribed fires on private or public lands within the State Responsibility Areas. Their Vegetation Management Program subsidizes the cost of planning and conducting a prescribed burn and provides insurance which alleviates the liability of an escape and possible post-burn erosion.

Specific pre-burn planning tasks must be completed prior to utilizing this technique. These include:.

¥ Developing a pre-burn plan or prescriptions: Working with a specialist a site specific prescription is developed that establishes the burn goals and procedures. The plan takes into accounts the site characteristics and the likely behavior of the fire including the heat output, length of burn, best ignition and control methods. These all have direct relationship to the type, age, density and condition of vegetation, the site topography, solar exposure and local wind patterns. The prescription identifies limits of burn area, control lines as well as participating fire departments' manpower and equipment resources.

¥ Coordinating with regulating agencies to review potential site specific environmental impacts and develop mitigation as required to reduce impacts on soil erosion, plants and wildlife, archaeological resources etc.

¥ Obtaining a burn permit from the local air quality management district: Current air pollution regulations limit open burning. However burning to reduce hazard, management of forest and range lands and to train fire protection personnel receives special accommodation. The local Air Quality Control District (AQCD) requires notification of the burn and that burning be conduction on a permissive burn day. The AQCD carefully selects these burn days based on air quality, weather conditions and wind patterns and must give their final "all clear" to the actual date 48 hours prior to the burn.

¥ Pre-burn site preparation: Manual or mechanical operations are often required to remove trees to thin the stand to a safe burning density, knock down tall brush and clean out fuels that could result in crown fires or the fire burning out of prescription. Site preparation also includes the establishment of fire lines and strategies needed to control the fire.

¥ Notification of burn: The public and neighboring agencies must be informed of the prescribed burn program to prevent unneeded concerns when smoke is produced. Notification of interested /affected parties and the media will need to be repeated the day of the burn. Staff should be present on site to explain the program to concerned citizens. Printed materials or interpretive signs should also be available at the site and distributed to neighbors. Prescribed fires generate high level of public safety concerns over the chance of escape. The rapid distribution rate of smoke, ash and soot may raise concern from the general public many miles away from the actual site of the prescribed burn.

¥ Post burn follow-up and evaluation. Evaluation of the burn unit after burning to determine the need for additional treatment based on aesthetics and established goals. Treatment might include removal by hand of unburned or partially burned materials and may be scheduled for a year to two year after a burn to reduce erosion impacts.

Manpower/Equipment required: Prescribed burns must be done by trained fire protection personnel. In order to benefit from cost-sharing aspects of CDF's Vegetation Management Program, CDF must conduct the burn. Utilizing the personnel and equipment from neighboring districts provides the added benefit of joint training under controlled rather than emergency conditions. Reputable companies with long history of experience are also available for performance of or assistance in this operation under contract. Staffing is often difficult if "borrowed" from other operations or jurisdictions.

Application: Prescribed fires are most effective in vegetation types such as grasslands, Eucalyptus groves, Pine stands, chaparral or Oak woodland where it can simulate natural fires and where it can be controlled. Both broadcast and pile burning are often used in conjunction with manual and mechanical techniques as a way to remove the debris.

Timing Considerations: Timing is critical to the use of this technique because of the restricted weather conditions. There are typically more "burn days" available in the spring and early summer than in the late summer or fall.

Treatment Life-cycle: Repetition of treatment varies depending upon specific target materials-- whether grassland or brush. A typical cycle for repeat burns is annually to control grasses, 3 to

5 years in shrub (where the goal is resource enhancement), with a longer cycle in closed canopy woodland (where growth is slowed due to shading from overstory).

Relative cost: The cost of prescribed burning greatly depends on participation of the CDF Vegetation Management Program, since this program allows a significant portion of the cost to be borne by the State (up to 90 percent of the burn cost). The State also provides liability insurance because the actual burning would be done by CDF. There are several fixed costs which are related to environmental review and documentation as well as notification of appropriate parties and monitoring of weather conditions. The next largest portion of costs is the site preparation which may make the fire more safe. This type of cost is quite variable, and may involve construction of wide "firelines" using hand crews, or crushing the brush in the burn area well ahead of the burn date. Costs can be reduced by using trails, roads, and natural breaks as lines, and by selecting weather conditions so as to minimize pre-treatment requirements.

Limiting Factors:
¥ Available "burn days" as determined by Air Quality Control District.
¥ Public acceptance
¥ Minimum size 5 acre (practical break off). Maximum size - some districts limit to an area that can be managed as a single day burn, in other areas multiple day burns are successfully completed .
¥ Physical configuration and access to site for establishing control lines
¥ Alternative treatments should be identified as a contingency to use of method.
¥ Environmental considerations such as wildlife or species of special concern.

Advantages
Cost effectiveness (especially for large areas)
Promotes plants that are "fire followers" or have adapted to fire. May also promote some species by removing competition (native grasses).
Improves habitat quality of old aged vegetation by promoting new growth
Creates park like visual quality with natural appearing boundaries after temporary blackened burn effects have dissipated
Relatively quiet
Minimal soil disturbance since less than 100% of vegetation is removed.
Effective in areas with tree overstory or steep terrain.
Can release nutrients tied up in undecayed fuel into soil
Quick treatment

Disadvantages
Politically/socially unpopular
Risk of escaped fire
May require extensive physical site preparation for initial burn
Expertise, equipment, scheduling, orienting & coordination & supervision required
Suppression resources required
Health considerations (smoke, poison oak)
Scheduling difficulties. Must wait for conditions suitable for burning (may not occur in any one year)
Short term visual impacts
Potential for increased sediment

5. Grazing

Description: This method includes the intentional use of animals to consume vegetation thus reducing the amount or density of fuel. Livestock do not effectively create a fuelbreak, but can be used to maintain this type of pre-suppression feature. Similarly, livestock can maintain an oak woodland free of significant understory. The option is effective where the plants are palatable to the animals selected. Control of the livestock and prevention of the impacts of

overgrazing is critical to successful use of this technique. As a fuel management technique, livestock need not graze every year. Practically, it may be difficult to obtain a lessee to graze on a non-annual basis or strictly to meet fuel management goals. Many of the existing grazing policies are based long standing, revenue generating agreements. Historically, grazing has been mostly by cattle, with a recent increase elsewhere in the use of goats for fuel management.

This method can be relatively inexpensive, and can generate revenue over large areas. It requires extensive control over livestock to ensure only the target plants are consumed. A range management plan and a grazing monitoring program has been established to identify the impacts and insure that the animals are removed once fuel management goals are met. Maintenance of weedy pests, such as artichoke thistle and French broom, needs to be coordinated so that methods are compatible with a grazing program. Specialized considerations include:

¥ Forage preference: Cattle and horses will eat primarily grass , but cattle prefer not to graze slopes over 30%. Sheep will eat both forbs and grass. Goats prefer forbs and shrubs, but will also eat grass. Steep slopes can be grazed by goats, sheep and horses.

¥ Perennial grasses require modifications from management of annual grasses. Because presence of healthy perennial grass stands has many benefits, these modifications are generally recommended. The benefits of perennial grasses are that they cure later in the season, which limits the opportunity for ignition. Mowing typically can be scheduled over a longer time period. Rotation of grazing animals is preferred over longer grazing pressure. Typically, perennial grasses react best when grazing is applied after seed maturation - from late spring through the fall.

¥ Fencing is by far the major expense in utilizing livestock for fuel management. Using professional herders or portable fences may be an alternative to fixed fencing where the treatment is ephemeral. Additional controls are also needed for protection of selected plant materials, riparian zones and to prevent erosion or other undesirable environmental impacts.

¥ Water sources are required for animals and will need to be provided if not readily available. Livestock access to riparian corridors or other natural water bodies can lead to degradation of water quality and habitat. Permanent stock ponds have the added advantage of providing a water source for fire fighting provided the pond has the required minimum depth and size.

¥ Cattle: Raised by individuals or commercially - revenue generally offsets costs. Minimum size for cattle grazing is generally 100 acres.

¥ Sheep: Sheep will eat both forbs and grass and will graze steep slopes. Their herding instinct allows professional herders to range in very mobile bands without the installation and maintenance of fences. However there is relatively little commercial activity in the East Bay and obtaining livestock may be difficult.

¥ Goats: Goats herding instinct allows professional herders to range in very mobile bands without the installation and maintenance of permanent fences. Portable electric fences are commonly used to help control the herd and the outcome of their grazing. Goats will browse materials up to 6 feet above the ground creating a desirable vertical separation between the canopy and ground cover. However, measures must be taken to prevent girdling of trees by goats browsing on bark. Herd movement has the advantage of breaking off dead material in a stand as well as punching a humus layer into the soil (if the ground is somewhat moist) and thereby removing available fuel.

Manpower/Equipment required: The provision of livestock is usually done under private contract or lease arrangements. Transportation and control of the animals are needed especially in discontinuous areas. Arrangements for winter pasture and other areas where livestock can be moved when they must be removed from a treatment location is critical to reduce potential adverse impacts.

Application: Grazing is most effective in grasslands or where shrubs exist. It can be an effective technique where there is an overstory forest that may limit other options.

Timing Considerations: Timing is critical to this method to ensure the palatability of the target plant materials, increase effectiveness (especially of grazing annual grasslands) and limit potential environmental damage. For example, grazing of cattle in locations with perennial grasses is best done during the spring or fall, and should rotational in nature. In another example, the effectiveness of goat grazing is more long lasting when done in the fall rather than spring. Grazing during summer months may remove forage beneficial to some wildlife species.

Treatment Life-cycle: Repetition of treatment varies depending upon specific target materials.
¥ Grazing an area once every three years or two successive years out of six will check shrubs from invading a grassland.
¥ Intense grazing of animals for a short period of time in the summer season would mimic the herds of animals the native flora is likely to be adapted to. This technique has been used experimentally as a tool for restoration of native perennial California grasslands. A greater number of wildflowers and native grasses could result from this regime, and a lower grass height would provide for more recreational opportunities and lower fire hazard. Grazing too early in the season could perpetuate annual grasses and over-grazing (reducing the residual dry matter below acceptable levels or keep animals in one area for a long time) can result in detrimental environmental impacts.
¥ Grazing of annual grasses yearly can promote shrub growth where it is already established.

Relative cost: May be revenue producing if cattle are used on large contiguous lands. Among the most expensive method when grazing small parcels with goats.

Limiting Factors:
¥ Fencing or control make this impractical as a perimeter only treatment.
¥ Slope increases potential environmental damage from grazing livestock.
¥ Erosion concerns: Sheep tend to nibble closest, horses pull the grass, and goats browse and trample. The residual material left is an important part of erosion mitigation and can be controlled by type of animal, number of livestock, grazing season and length of time.
¥ Practical difficulty in protecting individual specimens from being grazed.
¥ For use of sheep and goats, availability of livestock.

Advantages	*Disadvantages*
Produces revenue if cattle are used and fencing is in place.	Environmental concerns (soil erosion, wildlife compatibility, water quality)
Historical land use	Livestock to not eat all undesirable plants
Minimal health hazard	Minimal selection of target plants
Relatively quiet	Requires specialized management
Can be used in areas with a trees overstory	Visual impacts of operations & grazed area
Potential for revenue generation	Livestock can introduce weed and animal pest species (gophers, ground squirrels)
Relative short-term disruption (goats)	Constant disruption if cattle are used
Powerful grassland maintenance tool	Costly if goats & mobile herd is used.
	Odor

6. Chemical Treatments

Description: A variety of herbicides have been used in the past in fuel management. Health, safety and environmental concerns have limited the widespread use of chemicals. Repeated use of chemicals is not preferred due to the natural selection process occurs with new exotic weeds building resistance to the chemical and presenting a more difficult situation to manage.

Additionally, concerns with regard to water quality and chemistry limit the use of chemicals for fuel management.

An Integrated Pest Management (IPM) program to reduce the overall level of use of chemicals is often advantageous. However, judicious use of chemicals may be an acceptable solution in some cases provided there is sensitivity to time of application, dosage and safety measures. Specialize techniques include:

¥ Chemicals that prevent seed germination (pre-emergence chemicals) and kill sprouted plants (post-emergence chemicals) can be used to establish firebreaks and in roadside treatments. Application of sub lethal level of Roundup or Rodeo (both produced by Monsanto) has been shown to limit grass growth but still allow seed development maintaining a low fuel level without changing the species composition or encouraging weeds. Contra Costa County has had great success in chemically maintaining fire trails and fire breaks and for managing for native grasses.

¥ The use of Garlon 4-a appears to be one of the most successful treatments for the eradication of eucalyptus resprouting - other than completely uprooting the stump. The chemical moves down the stem and roots to control regrowth from underground reproductive parts.

¥ Foliar application with Roundup of French Broom and Eucalyptus resprouts is a common successful treatment.

¥ Roadside spraying: Foliar application of Round-up is common roadside treatment to eliminate fine fuels in areas of high ignition risk.

Manpower/Equipment required: Application requires specific storage, training and license.

Application: Hand application is the most flexible technique and best suited to small areas where application can be controlled.

Treatment Life-cycle: Repetition of treatment varies depending upon specific target materials.

¥ Spraying of annual weeds required on an annual basis.

¥ Stump treatment (including new cuts) may need to be followed up with foliar applications until re-sprouting is controlled.

Relative cost: Fairly inexpensive, but repetition makes total cost considerable.

Limiting Factors:

¥ Environmental sensitivity

¥ Timing (needs to be done at optimum growth stage and in dry weather).

¥ Effectiveness in all situations

Advantages	*Disadvantages*
Potentially a very selective technique with possibly complete control if applied by hand	Environmentally/politically sensitive
Possible to use in most physical conditions (steep slopes, wet ground, among other trees)	Expense
Relatively quiet and quick application	Requires follow up treatment to remove brush from site.
Little to no soil erosion impacts	Potential environmental hazard to sensitive plants, wildlife, soils & water
	Effectiveness may be spotty (dependent upon applicator)
	Timing
	Slow (hand applied)
	Government requirements

D. PROJECT LIST

1. History Of Fuel Management

Fuel management on the Alameda watershed has centered around the use of livestock for control of brush encroachment and biomass accumulation as well as disking or mowing as a means to reduce ignitions and fire spread along roads and property boundaries. Control of vegetation on dams is another type of project which is typically performed. Because of the grassy nature of much of the watershed, formal fuelbreak installation and maintenance as done on the Peninsula watershed is unnecessary.

E. FIRE PREVENTION MEASURES DURING PROJECT IMPLEMENTATION AND MAINTENANCE

Because most ignitions are caused by humans, the most direct ways of mitigating the potential risk are to limit the number of people and restrict their unsafe behavior. Control of public access can be accomplished by fencing, gating, signage, and/or by simply having aware watershed keepers on the site who would prohibit unauthorized access. Restrictions on unsafe fire behavior can be accomplished through education on such things as fire safety, in addition to prohibition of such things as smoking, parking off pavement, and use of fireworks. In terms of equipment use during project implementation or construction, unsafe behavior can be controlled by bans on equipment use during high fire danger, in areas of unmodified, easily ignited fuels, and before fuel modification is complete in any one area. The result of these controls regarding access to the numbers of people, and unsafe behavior is to minimize the number of ignitions.

All necessary precautions shall be taken to guard against wildfire resulting from project implementation and maintenance. All vehicles, chainsaws and other equipment shall have proper spark arresters and be in compliance with local ordinances. Firefighting tools, fire extinguishers, and water source should be available at the job site. In making final ground line cuts, chain saw operators should first clear litter and duff away from the base of the tree so that the saw is not placed against burnable materials. Smoking should be done only during breaks, in vehicles with ash trays or in an area cleared to mineral earth.

F. PROJECT DESCRIPTION/MAP

Even with previous and ongoing fuel management actions, the potential for loss is great, both in eventual likelihood and extent of loss. Reduction of the fuel hazard is recommended in the following plan. The projects have been located and described, and prioritized. The following list is not in order of priority; a discussion of priority is found in the Work Plan.

1. Treatment Units Overview

Name of Treatment Unit	Treatment	Objective served			
		Reduce Intensity	*Contain Fire*	*Min Spotting*	*Reduce Ignition*
Alameda					
1. Niles Canyon	*Rx, mow, prune*	X	X	X	X
2. Calaveras Crk	*Prune, mow Rx fire*	X	X		
3. Poverty Ridge	*Rx Fire*	X	X	X	X
4. Black Brush-Willm Gulch	*Rx Fire*	X	X		
5. Alameda Creek	*Pruning*	X	X		

Name of Treatment Unit	Treatment	Objective served			
		Reduce Intensity	*Contain Fire*	*Min Spotting*	*Reduce Ignition*
6. Below Sheridan Rd.	*Mow, prune*	X	X		X
7. Rx fire above Calaveras Rd.	*Rx fire*	X	X	X	
8. Exclusion burns	*Rx fire*	X			X
9. Roadside disking	*Disk*		X		X
10. 4291 clearance by cottages	*Hand work*	X		X	X
11. Grazing leases	*Grazing*	X	X	X	X
12. Powerline clearing	*Tree removal*				X
13. Tree fall clearing	*Firewood removal*	X			

2. Specific Project List

These vegetation/fuel management descriptions will state where the previous prescriptions/standards should be altered or applied in a different manner on the site. The schedule is a complete listing of actions required, including those actions required by the prescription. Recommendations given here provide more detail and regard modification and clarity of prescriptions explained previously. The standards apply unless modified by recommendations.

3. Organization

1. Unit - label corresponding to map and is followed by descriptive title of unit.
2. Vegetation type - existing
3. Vegetation type goal - proposed
4. Recommendation - clarify/modify standards. Unless modified here, the standards apply.

Several management actions are nearly universal. Sometimes they may not be specified for every management unit, but the actions should nonetheless be followed. These include:

- annual mowing (or, in the Alameda, grazing) of grasses or low herbaceous material (such as vetch) after they have cured.
- removal of French broom and other noxious weeds such as pampas grass, artichoke thistle, yellow star thistle, and Italian thistle.
- removal of dead wood, and sick shrubs and trees. Removal of dead wood should occur wherever found, and usually as high as can be reached. Trees with a live crown ratio of under 30% should be removed. The live crown ratio is determined by comparing the percentage of the crown which is living with the total height of the crown. (see diagram attached).
- when mowing with a string line (commonly referred to as weed whipping), caution should be exercised to stay away from young oaks. Grass within 1 ft from within the oak stem can be retained.

ALAMEDA WATERSHED FUEL MANAGEMENT PROJECTS

Project 1 - Niles Canyon

Vegetation Type: grass, scrub, oak woodland
Vegetation Type Goal: same
Treatment Goal: limit fire spread to off-site lands
Recommendations:

1. Clear uppermost, southwestern boundary as it abuts private lots. Mow for 30 ft on boundary, prune oak woodlands with hand labor for 100 ft width. Remove understory in same width. Create shrub islands for 100 ft width.
2. Work with neighbor to northwest to include off-site lands (to better align fire boundary with natural break in contour or fuels)

Schedule:

Initial Treatment:	Annual Treatment:	Other:
• prune trees	• mow grass	• work with neighbors to include off-site lands in treatments

Project 2 - Calaveras Crk.

Vegetation Type: grass, scrub, oak woodland
Vegetation Type Goal: same
Treatment Goal: limit fire spread to off-site lands
Recommendations:

1. Mow grass on southwestern boundary as it abuts private parcels to west for 30 ft width
2. Prune, remove understory of oak woodlands along Felter Rd. for 30 ft width
3. Continue roadside mowing/disking along road to reduce ignitions

Schedule:

Initial Treatment:	Annual Treatment:	Other:
• prune trees • remove understory	• mow/disk grass	• conduct prescribed burn of woodland every 7-10 yrs

Project 3 - Poverty Ridge

Vegetation Type: scrub, oak woodland, some grass
Vegetation Type Goal: oak woodland, grass, scrub
Treatment Goal: ease containment, reduce potential sedimentation, increase infiltration
Recommendations:

1. Work with EBRPD and/or other adjacent neighbors to break up brush fuels in Sunol Wilderness and surrounding parcels through a Coordinated Resource Management Plan
2. Concentrate treatments on Poverty Ridge locations
3. Conduct prescribed burns on scrub or chaparral areas on upper slopes of south-facing slope. Burn should be conducted after grass green-up occurs in late fall. Burn under very moist conditions to enable incomplete consumption of fuels. Adequate post-fire surface fuels is a requirement to prevent erosion of decomposed granite soils on site.

Schedule:

Initial Treatment:	Annual Treatment:	Other:
• establish CRMP • install control lines where necessary		• conduct prescribed burn of woodland every 7-10 yrs

- conduct prescribed burn of scrub every 5-years (or if chaparral, every 15-20 years)

Project 4 - Williams Gulch

Vegetation Type: mixed chaparral, north coastal scrub

Vegetation Type Goal: chaparral, scrub and grass

Treatment Goal; increase infiltration with increased grass cover, prevent sedimentation into reservoirs

Recommendations:

1. Conduct prescribed burns in chaparral stand of north-facing slope of William's Gulch. Cooperation will need to be secured of adjacent landowner to the south, perhaps through a CRMP. This may be done in one or two burns. Treatment need not be repeated for 15-25 years (not the 5-7 year stated in standard prescription)

Schedule:

Initial Treatment:	**Annual Treatment:**	**Other:**
• develop CRMP w/ neighbor • install control lines where necessary		• Conduct prescribed burn of scrub every 10-15 yrs • Conduct prescribed burn of chaparral every 15-25 years

Project 5 - Alameda Creek (Sections 6, 8, and upper 13,18&17 along Alameda Crk - Entry to EBRPD)

Vegetation Type: oak woodland, with some scrub, grass

Vegetation Type Goal: same

Treatment Goal: minimize roadside ignition and fire spread

Recommendations:

1. Remove understory of oak woodlands (define extent, location) This can be done with prescribed fire or, in small areas, with a herd of goats.
2. Prune, remove understory of oak woodlands along road for 30 ft width if this area is not contained in above treatment
3. Continue roadside mowing/disking along road to reduce ignitions

Schedule:

Initial Treatment:	**Annual Treatment:**	**Other:**
• prune trees • remove understory	• roadside mowing/disking	• conduct prescribed burn of woodland every 7-10 yrs or graze small portion with goats each year

Project 6 - Below Sheridan Rd.

Vegetation Type: oak woodland, grass

Vegetation Type Goal: same

Treatment Goal: limit fire spread to off-site lands

Recommendations:

1. Remove understory of oak woodlands on valleys leading to private parcels (north of Pirate Creek valley, and near Haynes Gulch on the west side of Sunol Valley), for a minimum width of 100 ft. Larger areas may be included in this treatment if prescribed fire is the treatment chosen. Should prescribed burning be conducted, dirt trails and roads should be used as control lines wherever possible. This project can be implemented with prescribed fire or with a herd of goats.
2. Mow grass along border (or nearest road) for a width of 30 ft.

Schedule:

Initial Treatment:	Annual Treatment:	Other:
• prune trees • remove understory • install control lines where necessary	• mow grass	• conduct prescribed burn of woodland every 7-10 yrs

Project 7 - Prescribed Fire Above Calaveras Rd.

Vegetation Type: oak woodland, north coastal scrub, grass

Vegetation Type Goal: same

Treatment Goal: limit fire spread to off-site lands, increase filtration

Recommendations:

1. Conduct four prescribed burns above Calaveras Rd. west to ridgeline, using jeep trails as control lines wherever possible.
2. The order of prescribed burns should be: (a) the northernmost parcel, then (b) the parcel second from the south, then (c) the parcel second from the north, then (d) the southernmost parcel.
3. Burning should occur when grass is green to reinforce control. This encompasses late spring when shrub leaf moisture is higher, or in the fall well after green-up occurs.
4. The burn objective would include a desire to leave a minimum of 25% ground cover when complete to reduce short-term sedimentation. Grass cover should increased by 50% in the following years.

Schedule:

Initial Treatment:	Annual Treatment:	Other:
• install control lines where necessary		• conduct prescribed burn of each of 4 parcels every 7-10 yrs

Project 8 - Exclusion Burns

Vegetation Type: coyote bush, grass
Vegetation Type Goal: grass
Treatment Goal: limit fire spread to off-site lands, increase filtration, halt succession into north coastal scrub fuels, to remove thatch to promote more healthy native grass stands

Recommendations:

1. Conduct prescribed burns in spring as grass cures. Burning can be expected to increase the grass cover to 80%.
2. As control lines use wet line technique, or existing dirt trails to avoid soil disturbance
3. Stay 300 ft away from reservoir shore

Schedule:

Initial Treatment:	**Annual Treatment:**	**Other:**
• install control lines where necessary		• conduct prescribed burn in each of 4 parcels every 5-7 yrs

Treatment 9 - Roadside Disking

Vegetation Type: grass,
Vegetation Type Goal: same
Treatment Goal: minimize ignitions, limit fire spread within SFWD lands, and to off-site lands
Recommendations:

1. Mow grass along roads for 30 ft width
2. Prune, remove understory of oak woodlands as they occur along roads (including Calaveras Rd., Vallecitos Rd. for 30 ft width

Schedule:

Initial Treatment:	**Annual Treatment:**	**Other:**
• prune trees	• mow/disk grass	

Project 10 - Clearance around Structures

Vegetation Type: ornamental, exotic trees, grass, scrub
Vegetation Type Goal: same
Treatment Goal: reduce structural damage from a wildfire, reduce ignitions, prevent spread of structural fire
Recommendations:

1. Comply with defensible space guidelines proposed. This is expected to be done primarily by hand, with some use of machinery around structures other than residences. Residents are expected to perform clearing, however, responsibility for clearance around other structures lies with SFWD.

Schedule:

Initial Treatment:	**Annual Treatment:**	**Other:**
	• comply with defensible space guidelines	

Project 11 - Grazing Leases

Vegetation Type: grass, with some oak woodland
Vegetation Type Goal: same
Treatment Goal: limit ignition, slow fire spread, reduce fire intensity which could damage resources and increase sedimentation
Recommendations:

1. Continue to maintain a relatively clear understory of oak woodlands throughout lease areas. This is done primarily through utilization and control of cattle grazing.
2. Comply with the range management plan
3. Where possible, shorten grass near roads and property boundaries to reduce ignition and spread potential near high risk locations.
4. Where flexibility exists, shorten grass along high risk areas early in season so grass is short when it cures. This action lengthens the effectiveness of grazing for fire management objectives.

Schedule:

Initial Treatment:	**Annual Treatment:**	**Other:**
• locate features which attract cattle near high risk areas	• comply with range mgt plan	

Project 12 - Powerline clearing

Vegetation Type: oak woodland, coniferous forest (Douglas fir, cypress, redwood)
Vegetation Type Goal: shorter oak woodland, thinned forest, some scrub
Treatment Goal: prevent ignition from power lines
Recommendations:

1. Remove hazard trees near power lines
2. Remove trees which could blow across power lines, or into power poles
3. This treatment should be responsibility of Pacific Gas & Electric. Communication regarding powerline clearing and maintenance should be ongoing.
4. The transmission lines and poles should be inspected yearly to determine where additional trees need to be removed. Such trees should be removed within the quarter.
5. Following significant storms, powerlines should be inspected for presence of trees which have obstructed transmission or caused failure in poles.

Schedule:

Initial Treatment:	**Annual Treatment:**	**Other:**
• remove hazardous trees • remove trees which can blow across power lines	• annual inspection and remedial tree removal	• inspect power lines and poles after significant storms

Project 13 - Treefall Removal

Vegetation Type: oak savanna and oak woodland
Vegetation Type Goal: same
Treatment Goal: remove heavy fuels to reduce damage to remaining adjacent trees
Recommendations:

1. Remove fallen trees, ensuring wildlife habitat is incorporated into the selection of dead wood to be removed. This operation should be contracted to a reputable company with strict controls on tree selection, methods of removal, and timing of access.
2. Following significant storms, powerlines should be inspected for presence of additional trees which have fallen, particularly across access points or in drainages.

Schedule:

Initial Treatment:	**Annual Treatment:**	**Other:**
• remove hazardous trees	• annual inspection and remedial tree removal	

V. FIRE RESPONSE PLAN

A. FIRE RESPONSE

The entirety of all San Francisco Water Department Lands is within the State Responsibility Area for which CDF provides fire suppression. Regardless, because of the remote nature of the much of the SFWD lands, it behooves the staff of SFWD to detect, report and make initial attack on fires on SFWD lands wherever possible.

Priorities for fire suppression are to minimize damage to persons, property and resources by:
1. protecting lives, and evacuating visitors and residents as necessary, before the Sheriff's Dept. assumes this role;
2. protecting all watershed structures as best possible, if they are in the path of the fire, and
3. starting initial fire suppression; discontinue suppression if the situation becomes unsafe or unmanageable;
4. assisting the Incident Commander as needed. Help identify best accesses, areas of danger, water sources. Be available as source of information (possibly staff are helpful at the Command Center rather than fire scene.

Development of fire suppression plans assists in minimizing damage. The California Department of Forestry and Fire Protection should be contacted to facilitate preparation of fire suppression plans for both watersheds.

B. DETECTION AND REPORTING

Often detection is made by passersby, more common now with cellular phones. Staff should report the fire to watershed dispatch (depending on the watershed, either Millbrae or Sunol), who should call 911. In every case a fire is detected, the dispatch or 911 should be notified before any further action is taken.

The following information should be included in telephone call to dispatch:
1. Location of the fire, name of watershed, location within the watershed. Use Thomas Brothers maps to aid location. Inform dispatcher you are using Thomas Bros. maps. Note the map page and map coordinates.
2. What is burning? Vegetation (grass, brush, trees), vehicle, or structure
3. How large is the fire? Is it lager or smaller than 1 acre (one acre is the same size as a football field)
4. Are people or structures in danger from the fire?
5. What is the best access for the fire department? Will there be personnel to meet them? Remember, you are the dispatcher's eyes do not use slang names for areas within the watershed.
6. Is there a need for other agencies to respond? PG&E, ambulance, CHP, Sheriff's office. etc.
7. What are you going to do? Evacuate public, notify grazing lessee (in Sunol), suppress the fire, or wait for fire department?

The Watershed Manager should be notified of the fire.

C. INITIAL ATTACK

Watershed Keeper vehicles are equipped with a 100-gallon pumper capacity. Initial attack should be made following size-up and reporting of the fire. If the fire appears to be easily

suppressed, initial attack should be made. If the fire is already large or if it is quickly gaining intensity beyond the capability of limited water and suppression ability, evacuate and report situation (and staff location) to watershed dispatch. Typically any fire with flames shorter than 4 ft can be safely extinguished with the equipment on the vehicle. Fires with flames between 4 to 8 ft in length may or may not be safety attacked and extinguished. Fires with flames longer than 8 ft in length are beyond initial attack capability.

Only staff with fire suppression training should attempt to fight fires. Employees should not attempt to suppress a fire without wearing proper equipment, which includes nomex fire suit, steel toe boots, safety helmet, goggles, and gloves. Each patrol truck should have a roll of 100 ft of 1 1/2 inch fire hose and a hydrant key. With this equipment various types of hydrants can be used to fill the pumper unit. Water sources are indicated on the attached map.

The entirety of the Water Department lands is protected by CDF. The station nearest to the Alameda Watershed is the Sunol Station, which is open year-round. Typical response times to watershed boundaries is within a few minutes for the Alameda watershed. However, response times to more remote locations can be 15-20 minutes.

D. EVACUATION PROCEDURE

Contact Alameda County Sheriff's Department, which is responsible for all evacuation procedures.

In the event that all evacuation routes are impassable, move all the people to an open meadow area (where - designated on the suppression map). Staff must also contact the Watershed Dispatch about the situation.

E. SOURCES OF MAPS TO PROVIDE INCIDENT COMMANDER

Fire response maps/plans are to be stored in: (1) the California Department of Forestry Headquarters in Felton and Morgan Hill. and (2) San Francisco Water Dept. Watershed Management Division files in Millbrae, CA. In addition, several agencies are involved with mutual aid and should also have fire response maps and plans. While the vast majority of incidents will involve wildland fire protection, strike teams may be formed from nearby structural fire protection districts. In some cases, structural fire protection districts such as the San Francisco Fire Department, may have brush rigs available for use. Usually the affected City will be contacted and will respond until a strike team can be formed by the Office of Emergency Services. The agencies which should have maps and plans on file include:

1. East Bay Regional Park District
2. Spring Valley Structural Fire Department
3. Alameda County Fire Department
4. Lawrence Livermore National Laboratory
5. Central Fire Department
6. Milpitas Fire Department
7. Smith Creek CDF Station

These maps and plans will depict and explain such items as the, safe zones, turnout locations, helispots, fuelbreak locations and natural barriers, evacuation routes and areas of limited or modified suppression.

F. TRAINING REQUIREMENTS

Several courses address the Incident Command System and suppression skills which are of potential value for SFWD staff. These are commonly known as "S"-courses and are offered through private training companies, or through public agency-sponsored forums. Most courses are based on curriculum developed by the National Wildfire Coordinating Group, which offers a course catalogue for inspection through the National Interagency Fire Center in Boise, Idaho.

I-220 Basic Firefighter and S-200 Initial Attack Incident Commander would benefit all watershed keepers, watershed managers, foresters and range managers, and operations personnel (Unimog operators) if they have not already been trained. This introduces the trainee to the Incident Command System, as well as basic wildland suppression strategies.

I-330 Task Force/Strike Team Leader Training would benefit watershed keepers, watershed managers, foresters and range managers, and operations personnel (Unimog operators). This course is design to teach the management skills needed to perform as a Strike Team Leader within the Incident Command System. In addition to the required ICS standard agenda, several hours is spent familiarizing trainees with Engine, Dozer, and Crew Strike Team needs and uses and on wildland fire behavior, and suppression tactics at the wildland urban interface.

I-334 Strike Team Leader Engine would benefit operations personnel (Unimog operators) and others with skills and responsibilities associated with fire engines. This course is designed to teach the management skills needed to perform as an Engine Strike Team Leader within the Incident Command System. In addition to the required ICS standard agenda, several hours is spent discussing engine capabilities and tactics, wildland hoselays, backfiring and burning out and structure protection at the wildland urban interface.

I-339 Division/Group Supervisor would benefit watershed keepers, watershed managers, foresters and range managers. This course is designed to teach the management skills needed to perform a Division or Group Supervisor within the Incident Command System. In addition to the required ICS standard agenda, several hours is spent on wildland strategy and tactics at the Division Supervisor level.

Either all or some S-190, 290 and 390 courses covering basic, beginning and intermediate fire behavior would benefit watershed keepers, watershed managers, foresters and range managers, and operations personnel (Unimog operators), depending on their involvement with fuel management projects and fire protection responsibility. These courses cover wildland fire behavior, mean of predicting fire behavior and factors involved in fire suppression and fuel management.

Occasionally, additional courses are offered which address the role of the landowner/decision-maker in fire suppression, or preparation and execution of prescribed burns. Personnel which would act as liaison with fire suppression crews and or be responsible for implementation of fuel management projects would benefit from such courses. In addition, courses regarding monitoring of program results are infrequently offered and may be of value to appropriate personnel.

On-site training is best when it is multi-agency, multi-jurisdictional, and includes simulated disasters. On-site training should encompass evacuation, initial attack, extended fire response (including Incident Command System 'refresher' courses). San Mateo County has a rich history of such exercises and the SFWD should continue their participation.

Staff involved in the implementation of the fuel management plan should be trained in plant identification and ecology of local species. Important concepts such as soil erosion and

landsliding processes and mitigation measures, regeneration mechanisms (sprouting and seeding), pruning guidelines, plant growth patterns, and vegetation succession should be included in the curriculum. A 4-hour refresher course each year would be of value.

VI. WORK PLAN

A. PRIORITIZATION OF PROJECTS

Projects which are required to establish fuelbreaks, and most directly project improvements and structures are highest priority. Those projects which need to be accomplished during the first year (and sometimes every year) follow:

1. Mow eastern border
2. Clear around structures
3. Clear around improvements
4. Roadside clearances of highly traveled roads which are not responsibility of Cal Trans or other entities. These include:

In addition, several projects should be initiated immediately. The areas are indicated on an attached map marked "Year 1 Actions" These include several prescribed burns in the basin which holds San Antonio Reservoir, and near Calaveras Rd.

B. SCHEDULING OF PROJECTS

All additional equipment should be purchased in the first year to take full advantage of the increased efficiency throughout the life of the fuel management project. Fire defense improvements should be obtained in a staged manner, with installation of heliports all within the first 5 years.

Because the initial work which establishes additional width or reduces vegetation accumulation will be a larger undertaking than maintenance, the level of effort following the first five years may be a fraction of the initial level of effort. Maintenance will, however, still be an ongoing part of the fire safety program. Development of important safety infrastructure features may take 10 years or more to complete, and will require maintenance from that point on. As noted in the standard prescriptions, the interval in time between treatments varies from annual to 7-10 years. This will require re-visiting the site for the purpose of fuel management at those intervals.

Additionally, events such as the severe windstorm of 1995 may trigger additional actions to remediate unforeseen events that add to fire hazards.

The schedule of treatments follows in a table which details costs per year for the first 10 years of the fuel management program.

VII. MONITORING PLAN

The monitoring plan recommended is to be that which is followed by the National Park Service - Western Regional Fire Monitoring Handbook, 1992.

The time requirements for monitoring are most intensive at the program's outset. Depending on travel times, two plots may be completed per day by one person. The level of sampling decreases with time.

Several advantages rest with the National Park Service Fire monitoring program. First, the data is comparable across the boundary of the Peninsula watershed. This implies that the data collected there can be used and potentially alleviate the burden of initial collection in that location. Initial data will need to collected in the Sunol watershed regardless. Second, the data will be comparable with other parks, such as Redwood National Park, which may have similar climate, fuels, vegetation types, and results from fire.

VIII. COSTS OF FUEL MANAGEMENT TECHNIQUES

The person-days of work used to figure costs are based no those developed in 1992 for the Mt. Tamalpais Vegetation Management Plan (sponsored by the Marin Municipal Water District and the Marin County Open Space District) as modified by a planning effort for the Berkeley National Laboratory. More recently, production rates and costs were customized for application to SFWD lands.

Person-days of work based on a charge rate of $30/hr. When Sheriff Inmate Crews are used, the 1994 daily rate for an 8-person crew was estimated at $200/day.

A. COSTS PER FUEL MANAGEMENT TECHNIQUE

1. Thinning - to fulfill prescriptions of:

◊ Eucalyptus

COST - Thinning is expected to **bring in revenues**, because volume is large, (although haul is long). The value or cost per acre is determined, in part, by the price of chips, pulp, and lumber, as well as the species, size of trees and quality of wood, volume per acre, and ease of access. The costs may range from $750/acre to revenue of $5,000 per acre.

Subsequent costs can be anticipated for stump sprout control of eucalyptus and potentially for erosion control efforts, public information (for heavily visited locations), and contract administration.

For the purposes of this initial cost estimate, the cost of exotic tree removal is $0.00, to consider potential costs which are offset by potential revenues.

2. Machine clearing with unimog - to fulfill prescription of:

◊ North Coastal Scrub
◊ Chaparral
◊ Successional Scrub

COST - A unimog can clear 1 acre in a range of 1 to 4 hrs. An average of 1 acre in 2 hrs is used for this cost estimate. Using a 6-hr day, a Unimog can treat 3 acres in 1 day. Machine usage costs are estimated at $150/day (which includes gas and maintenance). Operation for 6 hrs/day at $30/hr = $180 operation costs. Daily costs = $330/day. Costs per acre = $330/3ac =**$110/ac**

3. Hand labor - to fulfill prescription of:

◊ North coastal scrub
◊ Chaparral
◊ Successional Scrub

COST - Production rates for creating shrub islands for a 100-ft width is estimated at 7-22 person-days/ac. An average of 15 person-days/ac is used. Using a charge rate of $30/hr, or a $240/day costs = **$3500/ac.** Using Inmate crews, costs resulting from a $200/day 8-person crew = **$400/ac.**

4. Hand labor - to fulfill prescription of:

◊ Mixed Evergreen Forest and Oak Woodland

COST - This entails a combination of pruning and clearing debris to a chipper. Person-days estimated at 6 person-days/ac = **$1440/ac** for initial treatment, using a charge rate of $30/hr. Using Inmate crews, costs = $200/ac. Subsequent maintenance operations estimated at 2 person-days/ac = **$480/ac.**

5. Mechanical mowing - to fulfill prescription of:

◊ Grassland

COST - Production of tractor and operation estimated at 1.5 acres/hr, at a rental cost of $75/day. Using a 6-hr day, and hourly charge rate of $30/hr, the daily cost is $255. Cost per acre = **$28**

6. Cattle grazing - to fulfill prescription of:

◊ Grassland

◊ Mixed Evergreen Forest and Oak Woodland

COST - This will **generate revenue**, (a total of $290,000 in 1994) from which costs for habitat protection will be deducted. If cattle were not grazed, costs will be incurred for mowing, pruning and prescribed burning on an interval described in the standard prescriptions.

7. Goat grazing - to fulfill prescription of:

◊ Grassland

◊ Mixed Evergreen Forest and Oak Woodland

COST - **$500/ac** estimate for mixed evergreen forest and oak woodland
$400/ac estimate for grasslands

Assumes parcels greater than 5 acres in size

8. Goat grazing - to fulfill prescription of:

◊ North Coastal Scrub

◊ Chaparral

Successional Scrub

COST - $750/ac - $1000/ac (average at **$875/ac**)

Assumes parcels greater than 5 acres in size

9. Hand labor (weed whipping) - to fulfill prescription of:

◊ Grassland

COST - 1 person-day/ac = **$180/ac**, using $30/hr charge rate, and production of 1 acre/day (with a 6-hr day). Should inmate crews be used for this purpose, the cost is **$30/ac** using a $5/hr cost and a 6-hr day.

10. Chemical Treatment - to fulfill prescription of:

◊ Mature eucalyptus forest* - to control stump sprouts only

COST - Manual cutting of sprouts, removal disposal of sprouts and herbicide application = **$700/ac** (required over 5 yrs).

11. Line construction in Prescribed burning - to fulfill prescription of:

◊ North Coastal Scrub

◊ Chaparral

◊ Successional Scrub

COST - Participation in the California Department of Forestry and Fire Protection Vegetation Management Program would allow costs of actual burning to be born by the State. Pre-treatment such as brush crushing with a gravity roller or installation of lines around the burn would be the responsibility of SFWD. An average of 2 person-days per acre is required to construct control lines. Using a charge rate of $30/hr, costs = **$360/ac** for line construction, or other site preparation. Using Inmate crews, costs of prescribed burning = **$60/ac** for line construction or other site preparation. See costs for gravity roller as another pre-treatment.

12. Other Prescribed Burn Costs - involve 20 hrs of Staff time (at $30/hr) for

- Burn Plan Preparation - 4 hrs

- Notification - 8 hrs
- Burn participation - 8 hrs

Staff Time - 20 hrs @ $30/hr = $600

13. Prescribed burning - to fulfill prescription of:

- ◊ Mixed evergreen forest and Oak woodland
- ◊ Mature Eucalyptus Forest

COST - As above, participation in CDF's VMP covers many costs. Installation of lines in forested environments, as well as site preparation (minor pruning, thinning, and clearing around vulnerable sites) is estimated at 4 person-days/acre. Using a charge rate of $30/hr, costs = **$720/ac**. Using Inmate crews, costs of prescribed burning = **$120/ac**.

14. Gravity Roller - to fulfill pre-burn prescription of:

- ◊ North Coastal Scrub
- ◊ Chaparral
- ◊ Successional Scrub

COST - A gravity roller can crush 1 acres in 2 hrs. Using a 6-hr day, a gravity roller can treat 3 acres in 1 day. Machine usage costs are estimated at $75/day (which includes gas and maintenance). Operation for 6 hrs/day at $30/hr = $180 operation costs. Daily costs = $255/day. Costs per acre = $255/3 ac =**$83/ac**

B. COSTS FOR FIRE DEFENSE IMPROVEMENTS

1. Road Improvements

Costs for road improvements should be included in the ongoing road improvement and maintenance budget.

Re-establishment of culverts
Alignment of trails

2. Water Improvements

Dry hydrants
Heliports
Hydrants - $5,000, assuming no pavement or traffic control is required
Tanks - 10,000 capacity

Additional Equipment Needed

Now that multi-use equipment has been purchased, single-purpose equipment may be warranted. This would include a gravity-roller, brush-hog, or tiger-mower.

C. PROJECTION OF COSTS FOR COMING 5-10 YR HORIZON

Cost Elements

Fuel Management Costs

Project Costs	$234,500

- includes cost for mowing, thinning, burning,
- as well as preparation for burning, re-seeding,
- and rehabilitation costs
- uses contracted labor charges (not inmate crews)

Fire Defense Improvements Costs

Installation of Turnouts	$60,000

- spacing of 1/2 mile for 30 miles each watershed
- estimated cost of $1000 per turnout

Water Supply Improvements	$13,000

- includes hydrants, dry hydrants, water tanks
- includes both watershed

Installation of Heliports	$70,000

- includes pad, tanks, plumbing
- estimated 7 on Alameda
- estimated cost of $10,000 per heliport

Total Estimated Costs	**$377,500**

D. YEARLY FUEL MANAGEMENT COSTS

The following table details costs by Treatment Area and projects within the Treatment Area. These costs are spread out in the next 10 years according to the desired treatment schedule schedule, however every opportunity to further speed implementation should be pursued. Fuel management costs totaled $377,500 on the Alameda Watershed, with yearly costs ranging from $3,300 in Year 9 and 10 to $84,400 in Year 3.

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
55,800	28,000	84,400	16,200	11,600	4,800	12,500	14,400	3,300	3,300

IX. EXPANDED POLICIES

The following suggested actions are appropriate first steps as land management decisions are determined.

GOAL: PROTECT THE WATERSHEDS, ADJACENT URBAN AREAS AND THE PUBLIC FROM FIRE AND OTHER HAZARDS.

Subgoal F 1 Suppress Fires That Threaten Life, Private Property, and Public Safety.

Policy F 1.1 Review and update the SFWD Fire Pre-suppression Plan, as necessary and in conjunction with the CDF incorporating the following management recommendations:

Management Actions

F 1.1.A Develop a Fire Response Map/Plan that depicts and explains such items as the safe zones, turnout locations, helispots, fuelbreak locations and natural barriers, evacuation routes and areas of limited or modified suppression.

- Fire response maps/plans are to be stored in: (1) the California Department of Forestry Headquarters in Felton and Morgan Hill and (2) San Francisco Water Dept. Watershed Management Division files in Millbrae, CA.

- Provide these maps to cooperating agencies, to include:
  East Bay Regional Park District
  Spring Valley Structural Fire Department
  Alameda County Fire Department
  Lawrence Livermore National Laboratory
  Central Fire Department
  Milpitas Fire Department
  Smith Creek CDF Station

F 1.1.B Develop an inventory of equipment available for fire suppression. Make this list available to the above cooperating agencies.

F 1.1.C Watershed keepers and other first-responder personnel should make every effort to detect wildfires

F 1.1.D Watershed keepers and other trained and equipped personnel should make initial attack on a fire when a fire is detected. Initial attack should be made following size-up and reporting of the fire

- Watershed keepers should make initial attack on fires only if properly equipped with at least minimum standard equipment and wearing at least minimum standard protective clothing.

- Priorities for fire suppression are to minimize damage to persons, property and resources. Watershed keepers and other trained and equipped personnel should:

a) a) protect lives, and evacuate visitors and residents as necessary, before the Sheriff's Dept. assumes this role. In the event that all evacuation routes are impassable, move all the people to an open meadow area designated on the suppression map/plans. Contact Watershed Dispatch about the situation.

b) b) Protect all watershed structures as best possible, if they are in the path of the fire;
c) c) start initial fire suppression; discontinue suppression if the situation becomes unsafe or unmanageable; and
d) assist the Incident Commander as needed. Help identify best accesses, areas of danger, water sources. Be available as source of information (possibly staff are helpful at the Command Center rather than fire scene.

F 1.1.E Create a map and mileage chart of watershed fire roads and access points. Install coded signage on watershed roads and access points to facilitate emergency response.

F 1.1.F Establish fire management compartments that follow watershed boundaries rather than property boundaries, and for each compartment define travel routes, roads, fuelbreaks, incident base camp, staging area, water sources, natural barriers special interest areas and structures.

F 1.1.G Establish or update procedures by which a fire is initially reported once detected.

- Staff should report the fire to watershed dispatch, who should call 911. In every case a fire is detected, the dispatch or 911 should be notified before any further action is taken. The following information should be included in telephone call to dispatch:
    a) Location of the fire, name of watershed, location within the watershed. Use Thomas Brothers maps to aid location. Inform dispatcher you are using Thomas Bros. maps. Note the map page and map coordinates.
    b) What is burning? Vegetation (grass, brush, trees), vehicle, or structure
    c) How large is the fire? Is it larger or smaller than 1 acre (one acre is the same size as a football field)
    d) Are people or structures in danger from the fire?
    e) What is the best access for the fire department? Will there be personnel to meet them? Remember, you are the dispatcher's eyes do not use slang names for areas within the watershed.
    f) Is there a need for other agencies to respond? PG&E, ambulance, California Highway Patrol, Sheriff's office. etc.
    g) What are you going to do? Evacuate public, notify grazing lessee (in Sunol), suppress the fire, or wait for fire department?

- The Watershed Manager should be notified of the fire

F 1.1.H Coordinate with the San Mateo County and Santa Clara County Sheriff Department to update an evacuation plan which may include locations of safe refuges from fire.

F 1.1.I Install and maintain fire suppression infrastructure such as helispots, heliports, hydrants, safety zones, occasional water tanks, and road upgrades where necessary and feasible.

- In the Alameda Watershed, a total of 4 heliports are proposed on SFWD lands:
    a) In Section 27 on Weller Rd. at 1800 ft elevation*
    b) In Section 10 east of Mission Peak on access road to southern fork of Mill Creek Rd., at 1680 elevation*
    c) In Section 23 in Williams Gulch on access road as I enters and leaves SFWD northeastern boundary at 2000 ft elevation*

   d) In Section 27 west of Arroyo Hondo on Hades Ridge, at BM 3117

- In addition, 3 more heliports are proposed off SFWD lands:
  a) In Section 11, on Valpe Ridge on Rose Peak, VABM 3817
  b) In Section 2, on Wauhab Ridge, at a local peak of 3223 ft elevation
  c) In Section 6 (off SFWD lands) on EBRPD lands on the southern fork of Welsh Creek Rd. at a local peak of 2030 ft elevation*
  ** indicates heliport is adjacent to an access road*

- Hydrants - Four additional hydrants to be installed at the following locations:
  a) Section 3 near the southern intersection of Geary Rd. and Calaveras Rd
  b) At Calaveras Test Site
  c) At northeast border of SFD lands along Vallecitos Rd. northwest of Chevron facility
  d) Where jeep trail and Sunol Aqueduct intersection north of Sunol Valley Golf Courses

- Water Tanks - One 10,000 gallon metal water tank and one hydrant is proposed to be co-located in the southwest corner of Sect 3 where the jeep trail runs up to Poverty Ridge.

- Changes to access network will include addition of turnouts, turnarounds and safety zones as topography and soil characteristics permit. The exact location will be determined in the field. Occasionally, a new access route will be created to serve plan implementation needs. Examples of such access route may be those installed to remove the cypress groves over three treatments. Some management roads may not be suitable for continuous access however provides a route for treatments. The routes may grow in between uses, and need not be maintained to the same level as other more formal roads and trails.

F 1.1.J Design, place and maintain infrastructure to maximize the benefits to fire protection and vegetation management goals. (See guidelines under 1.2.1.I and 1.2.1.L.)

F 1.1.K Maintain fire roads to minimize sediment generation through effective installation of waterbars, avoidance of unnecessary grading, and paving short lengths of road where needed.

F 1.1.L Equip water sources such as large ponds, reservoirs, water tanks and perennial streams and springs with the capability for emergency water use. This may include installation of a dry hydrant or wharf valve.

- A total of nine dry hydrants are proposed on the Alameda Watershed. The location of these follow:
  a) Intersection of Sections 28, 29, 32 & 33 on Arroyo Hondo
  b) Section 30 south of eastern arm of the Calaveras Reservoir, on access rd.
  c) Near Goldfish pond, where Calaveras Rd. enters SFWD land from southwest
  d) In western half of Sect. 18 near Ridge Rd.
  e) In Section 17 near the Diversion Dam
  f) Along La Costa Crk south of the Hetch Hetchy Aqueduct east of BM 929
  g) Along the dirt road that connects Indian Creek and Apperson Crk. south of San Antonio Reservoir
  h) At the Cottage at the spillway of San Antonio Reservoir

i) East of Calaveras Rd., in the first drainage north of Hetch Hetchy Reservoir at approximately 900 ft elevation.

F 1.1.M Develop cooperative agreements with other agencies having similar fire-related concerns.

- Work with other agencies in Alameda and Santa Clara County to develop a Fire Safe Program. Investigate the possibility of using Alameda Sheriff Inmates as a source of labor for fire hazard reduction measures.

- Coordinate with adjacent private and public landowners, Alameda and Santa Clara Counties and the EBRPD regarding access and pre-suppression activities along boundaries (such as East Bay Regional Park District management of Sunol Wilderness).

  - Cooperate with adjacent landowners to establish 3 heliports off SFWD lands:

  a) In Section 11, on Valpe Ridge on Rose Peak, VABM 3817
  b) In Section 2, on Wauhab Ridge, at a local peak of 3223 ft elevation
  c) In Section 6 (off SFWD lands) on EBRPD lands on the southern fork of Welsh Creek Rd. at a local peak of 2030 ft elevation*
  ** indicates heliport is adjacent to an access road*

Policy F 1.2 Train first-responders personnel (such as watershed keepers) to Cal-OSHA standards on basic fire suppression and Incident Command System. Training should include the practices of detection and initial report of the fire, suppression evacuation and fire behavior.

Management Actions

F 1.2 A All watershed keepers, watershed managers, foresters and range managers, and operations personnel (Unimog operators) should be trained in I-220 Basic Firefighter and S-200 Initial Attack Incident Commander. This introduces the trainee to the Incident Command System, as well as basic wildland suppression strategies.

F 1.2 B All watershed keepers, watershed managers, foresters and range managers, and operations personnel (Unimog operators) should be trained in I-330 Task Force/Strike Team Leader Training. This course is design to teach the management skills needed to perform as a Strike Team Leader within the Incident Command System, as well as the needs and uses of the Engine, Dozer, and Crew Strike Team, wildland fire behavior, and suppression tactics at the wildland urban interface.

F 1.2 C All watershed keepers, watershed managers, foresters and range managers, and operations personnel (Unimog operators and others with skills and responsibilities associated with fire engines) should be trained in I-334 Engine Strike Team Leader. This course is designed to teach the management skills needed to perform as an Engine Strike Team Leader within the Incident Command System, engine capabilities and tactics, wildland hoselays, backfiring and burning out and structure protection at the wildland urban interface.

F 1.2 D All watershed keepers, watershed managers, foresters and range managers, should be trained in I-339 Division/Group. This course is designed to teach the management skills needed to perform a Division or Group Supervisor within the Incident Command System, wildland strategy and tactics at the Division Supervisor level.

F 1.2 E Personnel which would act as liaison with fire suppression crews should attend courses which address the role of the landowner/decision-maker in fire suppression.

F 1.2.F Multi-agency, multi-jurisdictional on-site training which includes simulated disasters should continue to be encouraged. SFWD staff should attend such training in other jurisdictions.

F 1.2.G On-site training should encompass evacuation, initial attack, extended fire response (including Incident Command System 'refresher' courses).

Policy F 1.3. Equip all first-responder personnel (e.g. watershed keepers) with a minimum standard of fire suppression equipment by May 1 annually.

Management Actions

F 1.3.A Watershed Keeper vehicles should be equipped with a 100-gallon pumper capacity. Each patrol truck should also have a roll of 100 ft of 1 1/2 inch fire hose and a hydrant key to accommodate various types of hydrants in order to fill the pumper unit.

F 1.3 B Watershed Keepers should be equipped with proper protective clothing. Proper protective clothing includes nomex fire suit, steel toe boots, safety helmet, goggles, and gloves. Employees should not attempt to suppress a fire without wearing proper protective clothing.

Subgoal F 2 Actively Mange Fuels to Reduce Chance of Damage or Loss to Values at Risk.

Policy F 2.1 Develop and maintain a system of fuelbreaks and modify fuels in conformance with the Pre-Suppression plan.

Management Actions

F 2.1.A Reduce fire intensity to minimize resource damage and limit fire spread to off-site lands.

- Poverty Ridge Fuel Treatment:
  a) Work with EBRPD and/or other adjacent neighbors to break up brush fuels in Sunol Wilderness and surrounding parcels through a Coordinated Resource Management Plan.
  b) Concentrate treatments on Poverty Ridge locations.
  c) Conduct prescribed burns on scrub or chaparral areas on upper slopes of south-facing slope. Burn should be conducted after grass green-up occurs in late fall. Burn under very moist conditions to enable incomplete consumption of fuels. Adequate post-fire surface fuels is a requirement to prevent erosion of decomposed granite soils on site.

- Conduct prescribed burns in the Coyote brush on the southeast shore of San Antonio Reservoir to limit fire spread to off-site lands, increase filtration, halt succession into north coastal scrub fuels, to remove thatch to promote more healthy native grass stands.
  a) Conduct prescribed burns in spring as grass cures. Burning can be expected to increase the grass cover to 80%.
  b) As control lines use wet line technique, or existing dirt trails to avoid soil disturbance.

   c) Stay 300 ft away from reservoir shore.

- Continue management of grazing leases reduce fire intensity which could damage resources and increase sedimentation.
  a) Continue to maintain a relatively clear understory of oak woodlands throughout lease areas. This is done primarily through utilization and control of cattle grazing.
  b) Comply with the range management plan.
  c) Where possible, shorten grass near roads and property boundaries to reduce ignition and spread potential near high risk locations.
  d) Where flexibility exists, shorten grass along high risk areas early in season so grass is short when it cures. This action lengthens the effectiveness of grazing for fire management objectives.

- Remove selected fallen trees to reduce damage to remaining adjacent trees.
  a) Remove fallen trees, ensuring wildlife habitat is incorporated into the selection of dead wood to be removed. This operation should be contracted to a reputable company with strict controls on tree selection, methods of removal, and timing of access.
  b) Following significant storms, powerlines should be inspected for presence of additional trees which have fallen, particularly across access points or in drainages.

F 2.1.B Reduce fuels in areas adjacent to access points to increase likelihood of containment in such locations.

- Minimize fire spread in Alameda Creek (Sections 6, 8, and upper 13,18&17 along Alameda Crk - Entry to EBRPD) by performing the following treatments:
  a) Remove understory of oak woodlands (define extent, location) This can be done with prescribed fire or, in small areas, with a herd of goats.
  b) Prune, remove understory of oak woodlands along road for 30 ft width if this area is not contained in above treatment.
  c) Continue roadside mowing/disking along road.

- Continue mowing along roadsides to limit fire spread within SFWD lands, and to off-site lands.
  a) Mow grass along roads for 30 ft width.
  b) Prune, remove understory of oak woodlands as they occur along roads (including Calaveras Rd., Vallecitos Rd. for 30 ft width.

F 2.1.C Reduce in fuels in areas adjacent to boundaries and/or high risks to reduce the intensity of fire (or chance of damage or loss to Values at Risk). The fuels in following areas should be treated in conformance with the Pre-Suppression Plan:

- Niles Canyon
  a) Clear uppermost, southwestern boundary of grass, scrub, and oak woodland as it abuts private lots. Mow for 30 ft on boundary, prune oak woodlands with hand labor for 100 ft width. Remove understory in same width. Create shrub islands for 100 ft width.
  b) Work with neighbor to northwest to include off-site lands (to better align fire boundary with natural break in contour or fuels).

- Calaveras Creek
    - a) Mow grass on southwestern boundary as it abuts private parcels to west for 30 ft width.
    - b) Prune, remove understory of oak woodlands along Felter Rd. for 30 ft width.
    - c) Continue roadside mowing/disking along road to reduce ignitions.

- Williams Gulch

  Conduct prescribed burns in chaparral stand of north-facing slope of William's Gulch. Cooperation will need to be secured of adjacent landowner to the south, perhaps through a CRMP. This may be done in one or two burns. Treatment need not be repeated for 15-25 years (not the 5-7 year stated in standard prescription).

- Below Sheridan Rd.
    - a) Remove understory of oak woodlands on valleys leading to private parcels (north of Pirate Creek valley, and near Haynes Gulch on the west side of Sunol Valley), for a minimum width of 100 ft. Larger areas may be included in this treatment if prescribed fire is the treatment chosen. Should prescribed burning be conducted, dirt trails and roads should be used as control lines wherever possible. This project can be implemented with prescribed fire or with a herd of goats.
    - b) Mow grass along border (or nearest road) for a width of 30 ft.

- Prescribed Fire Above Calaveras Rd.
    - a) Conduct four prescribed burns above Calaveras Rd. west to ridgeline, using jeep trails as control lines wherever possible.
    - b) The order of prescribed burns should be: (a) the northernmost parcel, then (b) the parcel second from the south, then (c) the parcel second from the north, then (d) the southernmost parcel.
    - c) Burning should occur when grass is green to reinforce control. This encompasses late spring when shrub leaf moisture is higher, or in the fall well after green-up occurs.
    - d) The burn objective would include a desire to leave a minimum of 25% ground cover when complete to reduce short-term sedimentation. Grass cover should increased by 50% in the following years.

F 2.1.D Review standard fuel treatments, based on fire severity rating, vegetation type and topography. In general, fuel reduction areas shall be wider where anticipated fire intensity is greater, for example, in saddles and above steeper slopes

F 2.1.E Design fuel treatments to minimize impacts to aesthetic scenic, and ecological resources, and consider objectives for vegetation management, wildlife habitat management, soil stabilization, public safety, ignition sources and safety of firefighting personnel.

F 2.1.F Where mechanical equipment or manual labor is used, create fuelbreaks with blended or feathered edges through selective thinning and by cutting indentations in brush to create bays. Interior areas of the fuelbreaks shall retain clumps of unmodified vegetation to provide cover and food for wildlife and create interest and variety in the landscape. Retain mature oaks in fuelbreaks for their wildlife benefits and scenic qualities. When prescribed fire is used, burn under a condition conducive to creating similar conditions.

F 2.1.G Firebreaks shall be discouraged where they do not also serve as roads or emergency access.

Policy F 2.2 Establish priorities for fuel management in areas around sensitive and high-value resources.

Management Actions

FS 2.2.A Give priority to fuel management activities near property boundaries, structures and improvements, such as the filtration plant.

- Projects which are required to directly protect improvements and structures are highest priority. Those projects which need to be accomplished during the first year (and sometimes every year) follow:
  a) Clear dam faces
  b) Clear around structures
  c) Clear around improvements
  d) Clear below Sheridan Rd., and above Niles Canyon

F 2.2.B Secondarily, focus fuel management treatments in areas of highest fire hazard created by a combination of fuel accumulation, topography, fire weather conditions and proximity to potential ignition sources.

- Projects which are required to reduce fire intensity at boundaries should be initiated immediately. These include a series of prescribed burns above and to the west of Calaveras Rd., and a prescribed fire in Williams Gulch.

- Roadside clearances of highly traveled roads which are not responsibility of Cal Trans or other entities are of high priority. These include: Calaveras Rd., Weller and Felter Rds.

- All additional equipment should be purchased in the first year to take full advantage of the increased efficiency throughout the life of the fuel management project. Fire defense improvements should be obtained in a staged manner, with installation of heliports all within the first five years.

F 2.2.C Manage fuels in locations that will reduce resource damage.

- Projects which will reduce resource damage should also be initiated at the beginning of the Fuel Treatment Workplan implementation. This includes removal of selected fallen trees, exotic trees, prescribed burns on the southeast shore of San Antonio Reservoir, and continued management of grazing leases.

Policy F 2.3. Develop a Fuel Treatment Workplan that provides goals for fuel treatment within a five to ten year period.

Management Actions

F 2.3.A Treat fuels in discontinuous patches or mosaics tailored to type of vegetation. For example, the understory of oak woodlands would be reduced with prescribed fire, manual labor or mechanical equipment; north coastal scrub and chaparral would be burned or cut, and redwood forest would be left untreated or burned with an understory broadcast burn.

Use the following treatments which consider wildlife habitat management, biodiversity, aesthetics, soil stability, and other factors which help determine the optimum treatment of vegetation.

- ***Prescription for Grasslands***
  a) Mow to 4 inches in height for a width of 10 ft from roadsides.
  b) Native grasses should be mowed to a height no shorter than 4 inches and may be mowed later in year to accommodate seed ripening and shatter.
  c) Around improvements, mow for a width of 30 ft on slopes <20%, 50-100 ft on slopes >20%.
  d) Maintain brush cover <30%, <20% where slope steepness >20%.

- ***Prescription for North Coastal Scrub***
  a) Create islands of <12 ft in diameter or 2xs the height of tallest shrub (whichever is smaller). Create clumps that are natural in appearance including specimens of variable age classes.
  b) Within 100 ft of improvements, grass between shrub islands should be mowed when cured.
  c) Distance between islands shall be greater than 2xs the height of tallest shrub or a minimum of 8 ft, whichever is greater.
  d) Retain between 30-40 percent of brush areas in brush crown cover
  e) The removal of brush should be based on criteria which are listed in approximate order of importance to fuel management objectives:
  ⇒ relative flammability - remove the most flammable species first.
  ⇒ plant vigor - remove shrubs of low vigor, dying or dead shrubs
  ⇒ sprouting capability - remove species with sprouting capacity first
  ⇒ effects of plant species on soils - i.e., retain shrubs with slope-holding capacity, that increase soil nutrients (ceanothus)
  ⇒ value for wildlife food and cover
  ⇒ aesthetic values
  ⇒ For example, priority for removal follows:
  f) chamise
  g) coyote bush
  h) poison oak
  i) blackberry
  j) northern sticky monkey flower
  k) coastal sage brush
  l) scrub oak
  m) manzanita
  n) thimbleberry, salmonberry
  o) wild currant
  ⇒ Remove only if necessary:
  p) coffeeberry
  q) buckeye
  r) ceanothus
  s) bush lupine
  t) madrone
  u) toyon
  v) coast live oak
  ⇒ The order of priority will change according to local conditions such as the relative abundance of each species. For example, where coffeeberry is not abundant, it may be placed high in priority to retain. Attempts should be made to maintain diversity of species.
  f) Maintain a crown cover of less than 30%.

g) Can convert to grass, especially in fuelbreaks.
h) Maintain less than 20% dead material in the shrub canopy.
I) Protect oak, madrone, buckeye and trees under 6 ft in height. Cut out shrubs below driplines and within 6 ft from edge of tree canopy.

- *Prescription for Successional Scrub*
  a) Follow prescriptions for north coastal scrub where trees do not exist.
  b) Protect tree specimens and encourage development for canopy closure. For trees over 8 ft tall, cut out shrubs below driplines and within 6 ft from edge of canopy.
  c) Mulch or permit grass (which may be grazed [on Alameda] or mowed) to provide cover between islands and trees.
  d) Protect oaks under 6 ft in height. Prune up to a maximum of 1/3 height of trees that are not taller than 24 ft tall.

- *Prescription for Chaparral*
  a) Create islands of <8 ft in diameter or 2xs the height of tallest shrub (whichever is smaller). Create clumps that are natural in appearance including specimens of variable age classes.
  b) Grass between shrub islands should be mowed when cured.
  c) Distance between islands shall be greater than 2xs the height of tallest shrub or a minimum of 6 ft, whichever is greater.
  d) Preferentially remove flammable sprouting species such as chamise and some manzanitas. Keep less flammable sprouting species such as oak, and coffeeberry. Keep species which require seed for reproduction such as ceanothus.
  e) Maintain a crown cover of less than 30%.
  f) Can convert to grass where site allows.
  g) Maintain less than 20% dead material in the shrub canopy.
  h) Protect oak trees under 6 ft in height.

- *Prescription for Mixed Evergreen Forests and Oak Woodlands*
  a) Prune branches up to 3 inches in diameter for a height of 8 ft. Prune up to a maximum of 1/3 height of trees that are not taller than 24 ft tall.
  b) Maintain under 5 tons/acre, with duff no deeper than 3 inches.
  c) Leave all trees bigger than 8 inches dia. Leave 1/3 of the trees under 8 inches to retain a range of size categories and species. Maintain a stand density of less than 50 trees per acre as long as canopy is still closed.
  d) Can mulch site to a maximum depth of 2 inches to prevent invasion of noxious weeds.

- *Prescription for Riparian Forest*
  a) Avoid treatment. Where necessary:
  b) Create or maintain an 8 ft vertical clearance between live needles and understory fuel. Remove all dead material. Prune branches up to 3 inches in diameter. Prune up to a maximum of 1/3 height for trees not taller than 24 ft in height.
  c) Maintain under 10 ton/ac. Depth of duff no greater than 5 inches.
  d) Mulch depth between 2 and 5 inches in depth.

F 2.3.B Reduce fuel loads within fuelbreaks on a recurring basis. Continue and expand uses of mechanical treatments, and develop alternative techniques such as prescribed burning, limited high-intensity grazing (e.g. with goat herd) restricted herbicide application, or other treatment methods.

- Treatment cycle in riparian areas are between 10-15 years.
- Treatment cycle is from 7-10 years in Mixed Evergreen Forests and Oak Woodlands.
- Anticipate 5-7 year treatment cycle in chaparral and north coastal scrub.
- In succesional scrub, anticipate initial treatment most significant operation, with annual mowing of grass between islands, and a treatment cycle of 5-7 years to maintain shrub islands in tree-less areas, and 3-5 years to maintain spaces surrounding emerging trees. As trees canopies touch (within 10 years in most cases), maintenance requirements dramatically decline.
- Annual grasslands require annual treatment, usually requiring treatment of all grass within 2 wks.
- All additional equipment should be purchased in the first year to take full advantage of the increased efficiency throughout the life of the fuel management project. Fire defense improvements should be obtained in a staged manner, with installation of heliports all within the first five years.

F 2.3.C Develop an annual work plan to track near-term success in achieving goals and for revising the following year's plan.

F 2.3. D. Diversify current practices for treating fuel complexes through expanded use of Sheriff inmate crews, CDF vegetation management program prescribed burns, and contract mechanical operators or other contracts to achieve the goals of the Fuel Treatment Workplan.

F 2.3. E. Single-purpose equipment should be purchased to enable efficient fuel management and to enable accomplishment of tasks specified in the yearly work plan. Single-purpose equipment that specifically cuts brush, mows grass, or crushes brush on steep slopes should be acquired.

Policy F 2.4. Establish monitoring procedures to tract the effectiveness and long-term effect of various fuel treatments.

Management Actions

F 2.4.A Establish permanent transects and vegetation plots in treatment and control areas, and measure suitable vegetation indices and physical characteristics over a five year period to determine effects of vegetation treatments.

- Monitoring should be done in a manner consistent with other land management agencies in order to obtain comparable data. Use comparable data to effectively increase sample size or to reduce demand by monitoring on staff.
- Appropriate personnel should obtain training regarding monitoring procedures and expected program results.

Policy F 2.5. Integrate, where feasible, experimental treatments into the Fuel Treatment Workplan that use prescribed burns to achieve ecological aims.

Management Actions

F 2.5.A Coordinate vegetation management projects with fire protection objectives so that the design, location and timing of the project benefits multiple objectives.

F 2.5.B Design fuel treatments using prescribed burns to assess the short-term and long-term effects of prescribed burns on the succesional pattern of plant communities, effects on wildlife habitat functions, and control of invasive, exotic plant species.

Policy F 2.6 Coordinate fire management activities with other watershed resource management activities and with neighboring landowners.

Management Actions

F 2.6.A Expand education efforts for City personnel, watershed users and adjacent property owners in regard to present fire, risks, hazards, and the need for fuel treatment efforts.

- In order to promote support for pre-suppression actions, education efforts should increase the awareness that wildland fire is inevitable, that unmanaged local fuel complexes eventually lead to fires with extreme and uncontrollable fire and that the watershed has significant urban interface/intermix resources at risk.

F 2.6.B Coordinate fuel management activities such as grazing or prescribed burns with adjacent large owners, especially along or between boundary areas.

- Establish a Coordinated Resource Management Program (CRMP) with adjacent landowners along the Whiting Ridge Fuelbreak to mechanically clear, drill grass seeds, and remove eucalyptus trees within established stands.
- Establish a Coordinated Resource Management Program (CRMP) with adjacent landowners along the Sweeney Ridge Fuelbreak to mechanically clear, burn, drill grass seeds and, thin trees in forested areas.

F 2.6.C Expand education efforts for City personnel, watershed users and adjacent property owners in regard to present fire, risks, hazards, and the need for fuel treatment efforts.

- In order to promote support for pre-suppression actions, education efforts should increase the awareness that wildland fire is inevitable, that unmanaged local fuel complexes eventually lead to fires with extreme and uncontrollable fire and that the watershed has significant urban interface/intermix resources at risk.

F 2.6.D Coordinate fuel management activities such as grazing or prescribed burns with adjacent large owners, especially along or between boundary areas.

- Establish a Coordinated Resource Management Program (CRMP) with adjacent landowners along Poverty Ridge to break up fuels in Sunol Wilderness and surrounding parcels.
- Establish a Coordinated Resource Management Program (CRMP) with adjacent landowners along Niles Canyon to better align the treatment area with natural breaks in contours or fuels.
- Cooperate with adjacent landowner in Williams Gulch to facilitate a prescribed burn and to better align the treatment area with natural breaks in contours or fuels.

Policy FS 2.7 Comply with local regulations regarding wildland fire safety including issues of defensible space, signage, vehicular access, and water supply.

Management Actions

F 2.7.A Systematically enforce all existing regulations in place fire hazard reduction and fire management with respect to adjacent private and public lands.

- Residents will be responsible for maintaining a 100 ft wide defensible space on all sides from the residence. Other structures will be similarly maintained by SFWD staff. All dead plants and combustible materials shall be removed within 100 ft of each structure to establish and maintain a defensible space. This includes those areas adjacent to driveways and along fence lines. Removal of combustible materials includes, but is not limited to, the following actions:
  a) Cut grass and weeds to less than 4 inches. Cutting of native grass and wildflowers may be delayed until after seed set unless they form a means of rapidly spreading fire to any structures.
  b) Remove all dead plant material from within 100 ft of each structure. This includes maintaining the ground, roofs, decking or balconies free of dead leaves, needles or other plant debris. This also includes removing from trees loose papery bark, and dead branches smaller than 3 inches in diameter, to 8 ft above ground. Remove all dead branches from within live ground covers, vines and shrubs.
  c) All live vines and live branches smaller than 3 inches in diameter shall be cut up to a height of 8 ft above ground.
  d) Remove plants as necessary to break vertical continuity between shrubs or ground covers, and trees, decks or overhangs on buildings. Vertical separation is the distance from the top of shrubs or ground cover to adjacent trees, designed to minimize the spread of fire to the crown of trees or structure roofs. Vertical spacing should be a minimum of 8 ft or 2 times the height of the understory plants to the leaves or needles of adjacent overstory trees, decks of overhangs, which ever provides greater separation. For overstory trees under 24 ft in height the minimum clearance can be reduced to 1/3 of the overall height of the overstory tree provided this reduced clearance does not form a means of rapid transmission of fire.
  e) Remove all branches within 10 ft of any chimney or stovepipe including chimneys on adjacent properties
  f) Chipped materials can remain on the site provided the chipped mulch layer is no greater than 2 inches in depth.

Subgoal F 3 Use Fire as a Tool to Help Approximate Vegetation Conditions that Occurred before Modern Watershed Management.

Policy F 3.1. Conduct investigations to determine the change in vegetation succession since presettlement and identify the characteristics of vegetation unaltered by modern management. Consider characteristics such as density, species composition, distribution structure and range of vegetation.

Policy F 3.2. Use prescribed fire to mimic natural disturbance regimes where compatible with other goals and policies. Prescribed fire can be used to invigorate fire-following herbaceous and obligate-seeding species in an interval within the range of normal disturbance regimes. Fire can also be used to restore a distribution of vegetation types and successional stages which more closely approximate conditions before modern management.

Management Actions

F 3.2.A Conduct a prescribed burn in Williams Gulch to regenerate an old chaparral stand.

F 3.2.B Prescribe burn the stands of coyote brush on the southeast shores of San Antonio Reservoir to increase infiltration, halt succession into north coastal scrub fuels, to remove thatch to promote more healthy native grass stands.

Policy F 3.3. Conduct pilot programs to assess the interaction of prescribed fire and watershed resources. Investigate changes in species composition and distribution, surface erosion, reduction in fire hazard, terrestrial habitat, and effects on sensitive species.

Subgoal F 4 Actively Limit the Chance of Ignition by Managing Fuels, Controlling Access and Restricting Activities.

Policy F 4.1. Maintain adequate clearance of vegetation on roadsides and around structures.

Management Actions

F 4.1.A Clear vegetation for a distance of 10 feet from each side of roadways to reduce ignition potential in areas of grass during the dry season (as specified by State Public Resources Code 4290-4291). Thin and remove dead vegetation at greater distances from roadways as appropriate.

F 4.1.B. Mow roadside and trailside areas, where appropriate, rather than disking in order to reduce erosion potential.

F 4.1.C Investigate and apply where possible techniques for controlling roadside vegetation (being tested by Contra Costa County Public Works Department) including flame control, re-seeding with native grasses, and use of hot water as an alternative to spraying of chemical herbicides.

F 4.1.D Clear flammable vegetation for a distance of 30-100 feet from all structures, remove dead vegetative material from roofs, and trim branches to a distance of 30 feet from chimneys, (installed with a screen) as specified by State Public Resources Code 4290-4291).

- This is expected to be done primarily by hand, with some use of machinery around structures other than residences. Residents are expected to perform clearing around the residence. Responsibility for clearance around other structures lies with SFWD.
- Initial treatment will entail pruning of lower branches on trees and shrubs; subsequent pruning is expected to be a minor task. Mowing will need to be done annually.

F 4.1.E Cooperate with PG&E to continue clearing around powerlines. Communicate with PG&E on an ongoing basis to remove hazardous conditions as soon as they are detected. The following actions should be conducted by PG&E.

- Remove hazardous trees near power lines
- Remove trees which could blow across power lines, or into power poles
- Transmission lines and poles should be inspected yearly to determine where additional trees need to be removed. Such trees should be removed within the quarter.
- Following significant storms, powerlines should be inspected for presence of trees which have obstructed transmission or caused failure in poles.

F 4.1.F Manage clearance of grass, brush, and understory as well as removal of low tree branches from roadsides and structures in a manner that integrates fire protection needs

and regulations, vegetation management objectives and special status plant protection. Manage grazing leases to both conform with the Fuel Treatment Workplan and the Grazing Plan.

Policy F 4.2. Restrict access to the Watershed and implement strict fire hazard reduction practices during periods of extreme fire hazard.

Management Actions

F 4.2.A Restrict public access by posting and gating access points to the Watershed. Implement watershed closure procedures during periods of extreme fire danger or when the National Weather Service Fire Weather Forecasting Office issues a "Red Flag Watch/Warning". Fire weather conditions of the Watershed include strong winds from the north or east coupled with high temperatures and low humidity.

- Extreme fire danger will be declared when on-site weather recording equipment indicate that the Burning Index exceeds 81, as calculated by the National Fire Danger Rating System.
- Establish and update procedures for Watershed closure which coordinates with nearby-landowners, transportation agencies and weather-monitoring agencies. Close all access to the Alameda Watershed when the fire danger is extreme or when the Red Flag Watch/Warning is issued. This includes the closure of all public roads such as Calaveras Rd., Weller Rd., and Felter Rd.

F 4.2.B Eliminate unnecessary vehicular travel by SFWD staff and require vehicles to carry fire suppression tools (e.g. shovel and fire extinguisher) during periods of extreme fire danger.

F 4.2.C. Systematically enforce existing regulations in place for limitation of unauthorized access and land use.

- Control of public access can be accomplished by fencing, gating, signage, and/or by simply having aware watershed keepers on the site who patrol the Watershed and would prohibit unauthorized access.

Policy F 4.3. Establish guidelines to limit the chance of ignition from specified activities.

Management Actions

F 4.3.A Establish operational brochures for equipment use, for smoking in designated areas, and for specialized measures implemented during times of high ignitability.

- All necessary precautions shall be taken to guard against wildfire resulting from the Fuel Treatment Workplan implementation and maintenance.
- Prohibit unsafe behavior such things as smoking in non-designated areas, parking off pavement, and use of fireworks during the fire season.
- Ensure all motorized equipment (e.g. motorized vehicles, chain saws, weed whippers) have spark arrestors, and that they comply with local ordinances. Firefighting tools, fire extinguishers, and water source should be available at the job site. In making final ground line cuts, chain saw operators should first clear litter and duff away from the base of the tree so that the saw is not placed against burnable materials. Smoking should be done only during breaks, in vehicles with ash trays or in an area cleared to mineral earth.
- During high fire danger, ban equipment use in areas of unmodified, easily ignited fuels, and before fuel modification is complete in any one area.

Subgoal F 5 Minimize Negative Environmental Impacts of Fire Hazard Reduction and Fire Suppression Techniques.

Policy F 5.1. Coordinate with CDF and other responsible fire protection agencies regarding pre-planned suppression techniques or specific locations based on "Light Hand on the Land techniques. Develop lines of communication between watershed management staff and CDF and institute an agreement regarding the appropriate use of bulldozers, retardant air drops, and other types of suppression in selected areas.

Policy F 5.2 Staff involved in the implementation of the fuel management plan and personnel who would act as liaison with fire suppression crews should be trained in landowner decisions and implementation considerations.

Management Actions

F 5.2.A Staff involved in the implementation of the fuel management plan should be trained in plant identification and ecology of local species, soil erosion, landsliding processes and mitigation measures, regeneration mechanisms (sprouting and seeding), pruning guidelines, plant growth patterns, and vegetation succession should be included in the curriculum. A 4-hour refresher course each year should be attended.

F 5.2.B Personnel which would act as liaison with fire suppression crews and or be responsible for implementation of fuel management projects should attend courses which address the role of the landowner/decision-maker in fire suppression, or preparation and execution of prescribed burns, and fire hazard reduction project monitoring.

F 5.2.C Personnel which would act as liaison with fire suppression crews and or be responsible for implementation of fuel management projects should attend training which addresses the role of the landowner/decision-maker in preparation and execution of prescribed burns.

Policy F 5.3 Conduct prescribed burns, application of herbicides, and operation of machinery for fuel treatments in an ecologically sound manner.

Management Actions

F 5.3.A Follow the standards for fuel treatment under 1.3.3 A. Other cautionary actions include the following:

- Leave all oak trees over 5 ft in height when developing fuelbreaks. Clear around (by hand) understory shrubs and prune lower oak limbs.
- Large rocks, lava outcroppings and high value specimens or clump of trees and shrubs should be left undisturbed.
- Avoid using mechanical equipment on slopes over 30%.
- No tree with evidence of use as nesting sites should be removed.

F 5.3.B Conduct surveys for known and potential special status species habitat prior to initial fuel treatments, and impose appropriate geographical or seasonal restrictions to ensure that the species and their habitat are protected from significant irreversible damage.

F 5.3.C Conduct prescribed burns under conditions that shall not harm obligate seeding species.

F 5.3D. Develop burn prescriptions that avoid conditions requiring extensive blading of firelines by heavy equipment. Use handlines, firebreaks, wetlines, Class A foam (outside of Streamside Management Zones), and hoselays to minimize blading for firelines.

F 5.3.E Avoid construction of firelines within Streamside Management Zones. Instead, use prescribed burns or limited seasonally-restricted grazing to reduce fuel load as part of pre-suppression activities.

F 5.3.F Prohibit aerial broadcast spraying of chemical herbicides as a means of vegetation management.

Policy F 5.4 Create firebreaks, firelines and apply chemical retardants in a manner that reduces non-point source pollution of surface waters and minimizes degradation of aquatic habitat during fire suppression activities.

Management Actions

F 5.4.A. Use air drops of hand crews during fire suppression in Streamside Management Zones rather than constructing firelines.

F 5.4.B Minimize use of chemical retardants and Class A foams (except protein-based foams) in or near aquatic zones.

F 5.4.C Use natural or in-place barriers such as roads, streams, reservoirs, and wetlands as well as, recently burned lands or areas of recent fuel modification as an acceptable way to minimize the need for fireline construction that would result in excessive erosion and sedimentation.

F 5.4.D. Construct firelines using practices that minimize erosion and sedimentation and prevent runoff from directly entering watercourses. Such practices include constructing firelines on the contour if possible or at a grade of 10 percent or less; making firelines only as deep and wide as necessary to control the spread of fire; installing grades, cross-ditches and water bars while the line is being constructed, and directing runoff into ditches, turnouts, onto filter strips or onto undisturbed sideslopes rather than into drainages.

Subgoal F 6 Limit Post-fire Remediation Efforts to Areas of Severe Ground Disturbance or Where Hazardous Conditions Occur; Otherwise Allow Burned Areas to Recover Naturally.

Policy F 6.1 Minimize intervention into the initial natural succession process of native vegetation after a burn has occurred.

Management Actions

F 6.1.A Cover exposed soils of firelines and burned slopes, subject to accelerated erosion rates, with the vegetative material displaced during construction or by distributing duff, litter or chips rather than the application of hydromulch. Cover shall protect the area from erosion, reduce invasion by weedy, exotic species and allow natural re-vegetation to occur.

F 6.1.B Use reseeding and hydromulch only in areas of severe ground disturbance.

- Use a mix of fast-growing, native perennial grasses such as California brome, blue wild rye and meadow barley rather than annual rye.

- Apply seed mix prior to onset of the rainy season and use hydromulch lightly to encourage rapid germination.

Policy F 6.2 Address effects of severe ground disturbance rather than on the wholesale effects of the burn.

Management Actions

F 6.2.A Concentrate post-fire erosion control efforts on the primary sources of accelerated erosion, such as fire suppression and/or post-fire reconstruction activities. Maintain erosion control measures on firelines after the burn.

F 6.2.B If needed, install long-term sediment retention basins that can be readily maintained or implement other permanent measures to prevent gully erosion, in preference to installing temporary straw bale structures that decay and release stored sediments into water bodies. Do not use organic materials like straw bales within SMZs without post-construction removal of the materials and accumulated sediment.

F 6.2.C Avoid placing erosion and sediment control features that increase infiltration and subsequent soil moisture on slopes that have a high probability of landslide failure.

F 6.2.D Consider using information on locations of shallow landsliding with the USGS real-time storm warning system to predict debris flow occurrence and pathways in post-fire conditions. Take measures to notify individuals at risk and re-route traffic appropriately.

Subgoal F 7 Conduct Inventories and Develop Plans to Help Guide Management Decisions.

Policy F 7.1 Identify areas of high fire hazard and the sensitive or high-value resources at risk within the Watershed.

Management Actions

F 7.1.A Classify the fire hazard severity of the Watershed based on comprehensive mapping of vegetation (specified as a fuel model), slope, and residential density in conformance with requirements of Bates Bill (AB 337).[1]

F 7.1.B Identify sensitive resources or high value resources at risk from fire and/or the effects of fuel management practices and fire suppression operations. Resources at risk can include habitat of endangered or threatened species, land having scenic values, areas known to contain cultural resources (including historic properties), developed facilities, and residential structures.

F 7.1.C Prepare a fuels survey map based on vegetation sampling plots and a percent vegetation cover map based on GIS data. Compile the fire weather conditions for San Mateo County. Use these data and a slope/aspect map from GIS topographic files to model and predict site-specific fire behavior with respect to rate of spread, flame length, fire intensity and spotting potential.

---

[1] Chapter 6.8, Part 1, Division 1, Title 5 of the Government code and Section 13108.5 of the Health and Safety Code.

F 7.1.D Evaluate and map fire hazard throughout watershed lands. Evaluate fire loss potential with a focus on current and proposed recreational activities (e.g. trail use) and adjacent residences and structures. Fire loss analysis shall be based on fire behavior, fuel load, slope, probable location and rate of ignition, potential loss of life, potential loss of valuable property, and access restrictions.

F 7.1.E Determine the operational needs for fire management including: level of effort for fuel modification, levels of fire danger that trigger special precautions, actions taken under high fire danger, and mutual aid agreements.

F 7.1.F Define fire management goals and techniques that are integrated with multi-objective resource management. Develop shrub management techniques which accomplish the following:

- Reduce wildfire frequency and intensity by reducing fuel loadings.
- Enhance wildlife habitat by increasing access, increasing edge, promoting growth of herbaceous forage, and rejuvenating shrub forage.
- Increase water yields by reducing transpirational losses produced by large volumes of brush.
- Maintain diverse, open brushlands for open space values.

F 7.1.G Develop fire management goals and techniques in close coordination with vegetation management goals to achieve the desired distribution and composition of plant communities. Describe appropriate treatment methods for achieving the target plant composition including mechanical, hand, limited herbicide application, and prescribed burn approaches.

F 7.1.H Summarize vegetation management objectives, treatments methods, suitability of treatment techniques under various conditions, return intervals for each prescription and vegetation type, and cost of prescriptions in a concise and usable format.

F 7.1.I Develop an implementation plan that specifies which areas need immediate treatment based on fire behavior predictions, values at risk, and site reconnaissance.

F 7.1.J Develop a pre-suppression plan that specifies development and maintenance of fire defense components such as fire compartments, firebreaks, fuelbreaks, roads, water sources, helispots, and mobilization points. Draft a pre-suppression agreement regarding "Light Hand on the Land" techniques (see F 1.1.1).

F 7.1.K Develop a day-to-day operations plan that includes:

- Criteria to trigger special precautions.
- Actions to take under high fire danger.
- Agreements to be made with local fire departments and agencies.
- A pre-attack plan developed in conjunction with the CDF.
- Incorporation of local RAWS (Remote Automatic Weather Stations) data into day-to-day operations.
- A site specific weather monitoring plan.

F 7.1.L Develop procedures for coordinating with cooperating agencies and land owners regarding vegetation clearance requirements.

F 7.1.M Develop recommendations for continued contract arrangements with California Department of Forestry for wildfire protection services and prescribed burns.

X. REFERENCES

Anderson, H.E. 1982. Aids to determining fuel models for estimating fire behavior. USDA For. Serv. Gen. Tech. Rep. Int-122. 22 p.

Andrews, P.L. 1986. BEHAVE: fire behavior prediction and fuel modeling system--BURN subsystem, part 1. USDA For. Serv. Gen. Tech. Rep. INT-194. 130 p.

Andrews, P.L. and C.H. Chase. 1989. BEHAVE fire behavior prediction and fuel modeling system--BURN subsystem, part 2. USDA For. Serv. Gen. Tech. Rep. INT-260. 93 p.

Barney, R.J. Fire management: a definition. J. Forestry 73:498-519.

Bay Area Air Quality Management District. undated. Open burning information. Bay Area Air Quality Management District, San Francisco, CA. 1 p.

Burgan, R.E. 1987. Concepts and interpreted examples in advanced fuel modeling. USDA For. Serv. Gen. Tech. Rep. INT-238. 40 p.

Burgan, R.E. and R.C. Rothermel. 1984. BEHAVE: fire behavior prediction and fuel modeling system--FUEL subsystem. USDA For. Serv. Gen. Tech. Rep. INT-167. 126 p.

California Department of Forestry and Fire Protection. 1984. Pre-suppression fire plan for San Francisco Water Department watershed lands in San Mateo County. Appendix. In: Grieg, J.E. Inc. Peninsula Watershed Management Plan pp. 136-216.

California Department of Forestry and Fire Protection. 1993. Bates Bill AB337 procedures and implementation: 1993. Sacramento Fire Prevention and Engineering. California Department of Forestry, Sacramento, CA.8 p.

California Public Resources Code. 1990. PRC 4290 and 4291. Fire safe regulations.

California State Assembly. 1991. Bill text, number AB337. Legislative Counsel's Digest, January 28, 1991.

East Bay Regional Park District. 1992. Wildland management policies and guidelines. Resolution No.1992-219. August 18, 1992. East Bay Regional Park District, Oakland, CA. 19 p plus appendices.

Grieg, J.E., Inc. Peninsula Watershed management program, San Francisco Water Department, Millbrae, CA.

Leonard Charles and Associates. 1993. Vegetation Management Plan. Report on file at the Marin Municipal Water District, Corte Madera. 231 p.

Martin, R.E. 1993. Proposal to East Bay Hills Consortium. Wildland fuel mapping and fire behavior modeling. Dept. of ESPM, Univ. of Calif., Berkeley. On file at the City of Oakland, Oakland, CA. 13 pp.

Martin, R.E. and J.D. Dell. 1978. Planning for prescribed burning in the inland northwest. USDA For. Serv. Gen. Tech. Rep. PNW-76. 67 p.

Martin, R.E., J.K. Gilless, P.J. Pagni, R.B. Williamson, D. Gordon, D.M. Molina, D.B. Sapsis, R. Schroeder, and S. Stephens. 1992. Wildland fire research laboratory studies of the

Oakland/Berkeley Hills "Tunnel" fire. Tech. Abstr. In: Proc. of State Fire Protection Engineers Symposium, Nov., 1992. Dallas, TX. pp 1-6.

Martin, R.E. and D.B. Sapsis. 1992. Fires as agents of biodiversity--pyrodiversity promotes biodiversity. In: Harris, R.R. and D.C. Erman (eds.) Proceedings of the Symposium on Biodiversity of Northwestern California Div. of Agric. and Nat. Res., Univ. of Calif., Berkeley, pp. 150-157.

McPherson, G.R., D.D. Wade, and C.B. Phillips. 1990. Glossary of wildland fire management terms used in the United States. SAF 90-05. Society of American Foresters, Wash., D.C. 138 p.

Moore H. 1981. Protecting residences from wildfires: a guide for homeowners, lawmakers, and planners. USDA For. Serv. Gen. Tech. Rep. PSW-50. 44 p.

National Fire Protection Association. 1992. Standard 299. National Fire Protection Association, Quincy, Ma.

Rice, Carol L. 1992. Fire and Fuels at the Wildland/Urban Interface. Pgs. 61-62. In Proceedings of Fire in Pacific Northwest Ecosystems: Exploring Emerging Issues, January 21-24, Portland, OR. Oregon State University, Corvallis, OR.

Rice, C.L. and C.R. Aronson. 1986. Fire Management Plan for the U.C. Hill Area. Report on file with U.C. Berkeley Office of Environmental Health and Safety. 123 p.

Carol Rice and J. B. Davis. 1991. Land use planning may reduce fire damage in the urban-wildland intermix. Pacific Southwest Forest and Range Experiment Station General Technical Report PSW-127.

Rice, Carol L., R. Montague, and R. Hodgson. 1990. Planning Guide for Fire Management in the Wildland/Urban Interface. Unpublished report submitted to the Fire Chief's Association of the County of San Mateo. 90 pp.

Rothermel. R.C. 1972. A mathematical model for predicting fire spread in wildland fuels. USDA For. Serv. Res. Pap. INT-115. 40 p.

Rothermel, R.C. 1983. How to predict the spread and intensity of forest and range fires. USDA For. Serv. Gen. Tech. Rep. INT-143. 161 p.

Rothermel, R.C. 1991. Predicting fire behavior and size of crown fires in the northern Rocky Mountains. USDA For. Serv. Gen. Tech. Rep. INT-438. 46 p.

San Mateo Co. 1993. Interface for the 90's. Proceedings of meeting held May 17, 1991. San Mateo County Fire Safe Program.

Sapsis, D.B. 1991. Marin Municipal Water District/Marin County Open Space District fuel inventory/fire behavior study. In: Vegetation and fire management baseline studies: tMarin Muncipal Water District and Marin County Open Space District, Technical Appendices, L.Charles and C. Rice. Report on file with Marin Municipal Water Dist. 29 p.

Sapsis, D.B. 1992. Progression of the Oakland Hills Tunnel Fire. Abstract in: Wind and Fire II. Pagni, Williamson and Martin (eds.) Proc. of an Open Seminar, Univ. Calif. Berkeley.

Sandberg, D.V. J.M. Peirovich, D.G. Fox, and E.W. Ross. 1979 Effects of fire on air. USDA For. Serv. Gen. Tech. Rep. WO-9. 39 p.

Strauss. D., L. Bednar, and R. Mees. 1989. Do one percent of forest fires cause ninety-nine percent of the damage? Forest Science. 35(2):319-328.

Tiedemann, A.R., C. Conrad, J. Dieterich, J. Hornbeck, W. Megahan, L. Viereck, and D. Wade. 1979. Effects of fire on water--A state-of-knowledge review. USDA For. Serv. Gen. Tech. Rep. WO-10. 28 p.

USDA Forest Service. 1993. Fire related considerations and strategies in support of ecosystem management. Washington Office, Fire and Aviation Management, Staffing Paper. 29 p.

USDI National Park Service. 1991. Statement for management. Golden Gate National Recreation Area, National Park Service, San Franscico, CA. November, 1991.

USDI National Park Service. 1992. Environmental assessment for the fire management Program. Golden Gate National Recreation Area, National Park Service, San Franscico, CA. March, 1992. 31 p.

Wells, C.G., R.E. Campbell, L.F. DeBano, C.E. Lewis, R.L. Fredriksen, E.C. Franklin, R.C. Froelich, and P.H. Dunn. 1979. Effects of fire on soil: a state-of-knowledge review. USDA For. Serv. Gen. Tech. Rep. WO-7. 34 p.

Appendix A-2

Alameda Creek Watershed
Grazing Resources Management Plan
July 1997

Alameda Creek Watershed

Grazing Resources Management Plan

prepared for

San Francisco
Public Utilities Commission

prepared by

EDAW, Inc.
Alameda County Resource Conservation District
San Francisco Public Utilities Commission Staff
San Francisco City Attorney Staff

July 1997

2_GRAZE.707

Table of Contents

INTRODUCTION 1

ISSUES AND CONCERNS 1
  - Pathogens 1
  - Livestock Management 2
  - Watershed Protection from Fire 2

GUIDING PRINCIPLES 2

GRAZING MANAGEMENT STRATEGY 3

LEASING STRATEGY 4
  - Lessee Selection Criteria 4
  - Lease Requirements and Terms 5
    - Base Level Stocking Rates and Requirements 5
    - Annual Operating Plans 5
    - Water Quality Protection 5
    - Timing of Calving 5
    - Staffing 5
    - Fee Structure 5
    - Lease Terms 6

WATERSHED PROTECTION AREAS AND IMPROVEMENTS 6
  - San Antonio Watershed Protection Area 6
    - Reservoir Buffers 9
    - Stream Zone Buffers 9
    - Riparian Pastures 9
    - Grazing Unit 9
  - Calaveras Watershed Protection Area 9
    - Reservoir Buffers 10
    - Stream Zone Buffers 10
    - Inaccessible Zones 10
    - Riparian Pastures 10
    - Grazing Units 10
  - Lower Alameda Creek Watershed Protection Area 11
    - Stream Zone Buffers 12
    - Inaccessible Zones 12
    - Grazing Units 12

PROGRAM PHASING 12

WATERSHED MONITORING 13

FUNDING OF IMPROVEMENTS 13

APPENDICES

Appendix I: Sample Draft Grazing Lease . . . . follows page 13

Appendix II: HACCP-Based Program to Control Cryptosporidium and Other Waterborne Pathogens in the Alameda Watershed . . . . on file at SFPUC

Appendix III: Alameda Watershed Summary of Meetings, Technical Review and Stakeholders Comments March-April 1997 . . . . . . on file at SFPUC

Appendix IV: Draft Alameda Watershed Range Management Plan . . . . on file at SFPUC

FIGURES

Figure 1 - Grazing Resources Management Plan: Priority Areas 7
Figure 2 - Grazing Resources Management Plan 8

TABLES

Table 1: San Antonio Watershed Protection Area Proposed Improvements 6
Table 2: San Antonio Watershed Protection Area Grazing Unit 9
Table 3: Calaveras Watershed Protection Area Proposed Improvements 10
Table 4: Calaveras Watershed Protection Area Grazing Units 11
Table 5: Lower Alameda Creek Watershed Protection Area Proposed Improvements 11
Table 6: Lower Alameda Creek Watershed Protection Area Grazing Units 12

INTRODUCTION

The protection and management of the Alameda Creek Watershed is of vital importance to the San Francisco Public Utilities Commission (SFPUC). As custodian of nearly 40,000 acres and approximately 30% of the Southern Alameda Creek Watershed, the SFPUC is responsible for managing the watershed to achieve their primary goal of protection, maintenance and enhancement of source water quality. The SFPUC must also manage the watershed in a fiscally responsible, comprehensive manner. This Grazing Resources Management Plan is an element of the overall Alameda Watershed Management Plan, currently being prepared for the SFPUC. The primary goal of the SFPUC for these two plans is water quality protection.

This plan was prepared in response to concerns regarding the appropriateness of grazing on watershed lands. These concerns relate primarily to water quality and are discussed in the following section. In response to these concerns, the SFPUC has received and considered valuable information on the subject of grazing and has used the following documents in the development of this final Grazing Resources Management Plan: a "HACCP-Based Program to Control Cryptosporidium and other Waterborne Pathogens in the Alameda Watershed" prepared by the Alameda County Resource Conservation District; "Alameda Watershed Summary of Meetings, Technical Review and Stakeholders Comments March-April 1997" which documents the extensive public participation process which surrounded the preparation of the HACCP plan; and the October 1995 "Draft Alameda Watershed Range Management Plan". These documents are Appendices to this plan and are on file at the SFPUC.

ISSUES AND CONCERNS

A number of management strategies are currently employed by the SFPUC to manage the Alameda Watershed. Grazing is one of these management strategies and is used to control fire hazard and maintain the general health of the land as well as to generate revenue for the SFPUC. Grazing, however, has raised issues and concerns about water quality and the pathogen, cryptosporidium; about overall livestock management; and about the protection of the watershed from fire. All of these issues are interrelated and as such, have some relationship to water quality. Each issue is summarized below:

Pathogens

The primary pathogen of concern is cryptosporidium (C. parvum). This species has been found to cause illness in humans and is of greatest concern to immuno-compromised individuals. In general, the presence of pathogens in the system reservoirs is very low, often occurring just at or below detection limits. However, there is no logical pattern to their occurrences that lead to any conclusions about the source of generators of these pathogenetic cysts.

While it is known that many warm-blooded mammals are carriers and vectors of pathogens, and particularly cryptosporidium, investigations demonstrate that there is about a 5% occurrence in livestock compared to nearly 50% occurrence in rodents. Among livestock carriers, it is generally the young calves, especially those in the first four months of life, that shed viable cysts the most. In general, pathogens shed by livestock cannot survive long in the warm summer and fall periods, but can survive for up to 6 months or more in a cool moist environment.

Samples of rodents on the watershed have not been taken. However, recent investigations in other areas have revealed a high incidence of cryptosporidium in one predator of rodents; coyotes. Studies have not concluded that the species of cryptosporidium present was C. parvum, the species of human concern. Samples from feral pigs on the watershed have yielded positive results for cryptosporidium.

Livestock Management

Optimum cattle health is essential to maintaining water quality. Three management techniques help to assure water quality - timing of calving, adjustments in stocking levels and establishment of an ongoing herd health program.

To maintain optimum herd health, the mother cow must be healthy when she gives birth. Both mother cow and calf must also be able to regain/gain strength quickly after birth. In order for this to occur, adequate forage must be available. By timing calving to coincide with the beginning of the growing season (August through October) the mother cow and calf are able to feed on the highest nutrient grasses throughout the growing season and ensure optimum health.

Because the amount of available forage is directly dependent on the weather cycles (i.e. drought versus extremely wet years), adjustments in stocking levels are essential to compensate for fluctuations in available forage. This helps maintain cow-calf health and protect the watershed from overgrazing.

Finally, the management of the health of each herd is essential for maintaining healthy cows and calves. An aggressive herd health plan, administered on a timely basis, is critical to herd health.

Watershed Protection from Fire

The use of cattle is essential to prevent vegetation over-growth and an increased risk of fire. In the absence of a grazing program, average fuel-loading rates would increase from a low fire hazard condition (1 ton per acre of grass type) to a moderate fire hazard condition (4 tons per acre of a medium brush type) in less than 5 years. In 20 years there would be 10 tons per acre of medium to heavy brush. An increased fuel load of this magnitude would have significant financial implications; grazing currently produces $10 per acre per year of revenue; controlling the increased fire hazard through mechanical, prescribed fire, chemical, and manual methods of vegetation control would cost $250-$300 per acre per year or more. It would be necessary to treat 30,000 or more acres every three to five years.

The absence of cattle grazing would also result in a exponential population increase of rodents throughout the watershed. Upon elimination of grazing, stands of grass and thatch grow heavier, creating ideal habitat for rodents. The incidence of cryptosporidium in rodent populations is known to be high; about 50%.

The absence of livestock to compete for available forage would also result in exponential increased rates of populations in feral pigs, tule elk, and other wildlife. Feral pigs on the Alameda Creek Watershed have been confirmed as carriers of cryptosporidium.

GUIDING PRINCIPLES

In response to the issues and concerns discussed above, six guiding principles, upon which this Grazing Resources Management Plan is based, have been established to significantly reduce risk to water quality from waterborne pathogens carried by cattle and other mammals:

- Non-calf, non-corral buffers will be maintained around reservoirs and streams with riparian habitat to prevent the entry of waterborne pathogens into the areas of greatest sensitivity.
- Calving will be limited to August through October annually to lessen the risk of young calves (less than four months of age) shedding cryptosporidium during the peak runoff season.

- Water developments and supplemental feeders will be located away from stream channels, swales, flood plains or other sensitive areas.
- Each lessee will develop a herd health program for the prevention and care of general parasitic disease, to maintain healthy immune systems and minimize diarrheal infection.
- Stocking rates will be set for each parcel to achieve a target RDM of 1000 lbs/acre to insure even distribution of livestock and utilization of forage. In no event shall RDM levels fall below 800 lbs/acre.
- A persistent, flexible control program to reduce feral pig densities will be established.

GRAZING MANAGEMENT STRATEGY

The guiding principles set forth above translate into an overall grazing management strategy which consists of a set of management controls and required structural protection measures. These are specifically designed to reduce the risk of viable pathogen discharges into watershed streams and reservoirs by enhancing the health of the riparian zones and reservoir margins. They are also designed to maintain and improve ecological resources in other areas of the watershed by insuring that vegetation growth will be kept under control. Financially, they are designed to produce revenue and avoid implementation of a costly, intensive and sustained fuel hazard program.

The overall management controls include the following requirements:

- Cattle utilization defined in terms of Animal Unit Months (AUM) reduced by at least 40% of pre-1991 stocking levels.
- A grazing lease fee payment structure based on Animal Unit Months. In no case will fees for grazing leases be based on a price per acre.
- A lease requirement that sets the target Residual Dry Matter (RDM) forage level on September 1 annually at 1,000 lbs. per acre. At no time shall RDM levels on any portion of the watershed drop below 800 lbs. per acre.
- A lease requirement for preparation and approval of an Annual Operating Plan, including a herd health component, by October 1 annually.
- A lease requirement of a restricted calving period limited to August through October annually. Calving must be 80% complete by September 30 and 100% complete by October 31.
- Immediate consolidation of smaller existing leasehold areas into larger and more economically efficient grazing units. Some inefficient parcels may be identified as non-essential for SFPUC watershed protection.

The key features of the structural protection measures include:

- Fenced Reservoir Buffers restricting all cattle access.
- Stream Zone Buffers restricting all cattle access.
- Fenced Riparian Pastures restricting access by calves.

- Fenced stock water ponds on key water courses to prevent direct access by cattle.

- Watershed Protection Areas open to general grazing by cows and calves. These areas are developed intensively with water collection and distribution improvements to disperse cattle uniformly away from riparian pastures and achieve uniform utilization of available forage throughout the area.

- Development of off-stream cattle and wildlife water improvements to disperse deer, elk, and feral pigs away from key water courses and sensitive riparian pastures.

LEASING STRATEGY

The grazing lease strategy for the Alameda Watershed consists of criteria for lessee selection, which interested parties will be required to meet prior to submitting a bid, and a set of lease requirements and terms. These relate to stocking rate requirements, annual operating plans, water quality protection, timing of calving, staffing, fee structure and lease terms. A sample lease is included in Appendix I of this document.

Lessee Selection Criteria

- Interested parties may consist of an individual, corporation, partnership or trust. Legal documentation will be required for proof of business structure.

- Interested parties will submit a resume and summary of operations conducted. Information should include the scope and location of historical and current operating units. The information should be in narrative form and may be supported by photographs, maps and other documentation that provides evidence of management experience.

- As a minimum, each potential lessee will address areas of resource operation and management experience including, but not limited to:
  - Rangeland Improvements (fencing, corrals, vegetation enhancement)
  - Water Resources Development (springs, stock ponds, wells)
  - Range Utilization Methods (pasture rotation, water distribution, salt distribution)
  - Conventional Pest Control (rodent control, thistle control, application methods)
  - Integrated Pest Management
  - Fire Hazard Reduction Practices
  - Protection, Enhancement and Management of Riparian Areas
  - Range Monitoring Practices
  - Supplemental Feeding Practices
  - Erosion Control Practices
  - Herd Health Management Practices

- Interested parties will submit a current and signed Financial Statement (Asset:Liability Balance Sheet) for any and all entities and/or individuals that will be signatory to the lease(s).

- Interested parties will submit Letters of Reference from current and recent (last three years) landlords of grazing and other agricultural lease holdings, if applicable.

- Interested parties will submit letters of Reference from financial institutions of current or recent agri-business transactions.

Lease Requirements and Terms

Base Level Stocking Rates and Requirements

All grazing units will be leased on an animal unit month (AUM) basis; both in terms of stocking levels and payment method. No grazing units will be leased on a per acre or other basis. Stocking rates in animal unit months for each grazing unit in each watershed protection area are found in Tables 2, 4 and 6 in the following sections. These are the stocking levels to be allocated for each grazing unit area lease. Each lease will require Residual Dry Matter (RDM) measurements on or about May 15 to monitor spring forage conditions and RDM measurements for September 1 annually. Each lease will require adjustments in stocking levels based on interim season (May 15) RDM measurements found to be below that targeted by the Annual Operating Plan (see below).

Annual Operating Plans

Annual Operating Plans will be prepared and submitted by the lessee for each grazing unit by October 1 annually. The annual operating plan will reflect the number of animal unit months to be stocked on each grazing unit based on current forage conditions. It will also include a Residual Dry Matter (RDM) target level for May 15 annually for the AUM specified. The plan will also identify the tenant's season of use, specific watershed improvement requirements, herd health plan, pest control actions, fiscal requirements, verification of security measures including insurance requirements, and pre-approved tenant improvement credits.

Water Quality Protection

Prior to leasing each unit, the water quality protection measures identified for each lease unit must either be completed or a plan for completing them must be identified. These improvements may be completed by SFWD or the lease may stipulate the improvements the lessee is required to make and identify a time frame for improvements to be completed. Financing of improvements will be defined on a case by case basis as discussed in Funding of Improvements. Water quality protection performance standards will also be incorporated into each lease. Several water quality parameters will be analyzed on a regular basis to identify whether the standards are being met. If the standards are not met, the lease can be terminated.

Timing of Calving

All lessees will be required to time calving between August and October of each year. Calving must be 80% complete by September 30 and 100% complete by October 31 of each year.

Staffing

Each lessee will be required to maintain an active presence on the property. At a minimum, one full time staff person will be required on site to manage each grazing unit.

Fee Structure

The payment method for each grazing unit will be based on the number of animal unit months allocated to the grazing unit adjusted as necessary for each annual operating period. Payments may be made on a quarterly basis. The fee may be adjusted quarterly based on adjustments in stocking levels.

Lease Terms

Tenant stability and tenure is vital to a successful grazing program. Initial leases will be for five-year periods. Depending on the results of monitoring (see Watershed Monitoring section) and favorable measurements of program effectiveness and compliance, future leases may be issued for up to ten years to provide a stable grazing program.

WATERSHED PROTECTION AREAS AND IMPROVEMENTS

The Alameda Creek Watershed has been sub-divided into three geographic watershed protection areas. They are identified as the San Antonio, Calaveras, and Lower Alameda Creek Watershed Protection Areas. This is done to prioritize the areas to be addressed, to identify the details required to manage each area, and to identify improvements for each area. Figure 1 identifies the three watershed protection areas. Figure 2 indicates the locations and types of improvements required. Stream and reservoir buffers, riparian pastures, inaccessible areas, and grazing units are also delineated. Each lease developed will include a map of the lease unit based on the management controls and structural controls established in this plan.

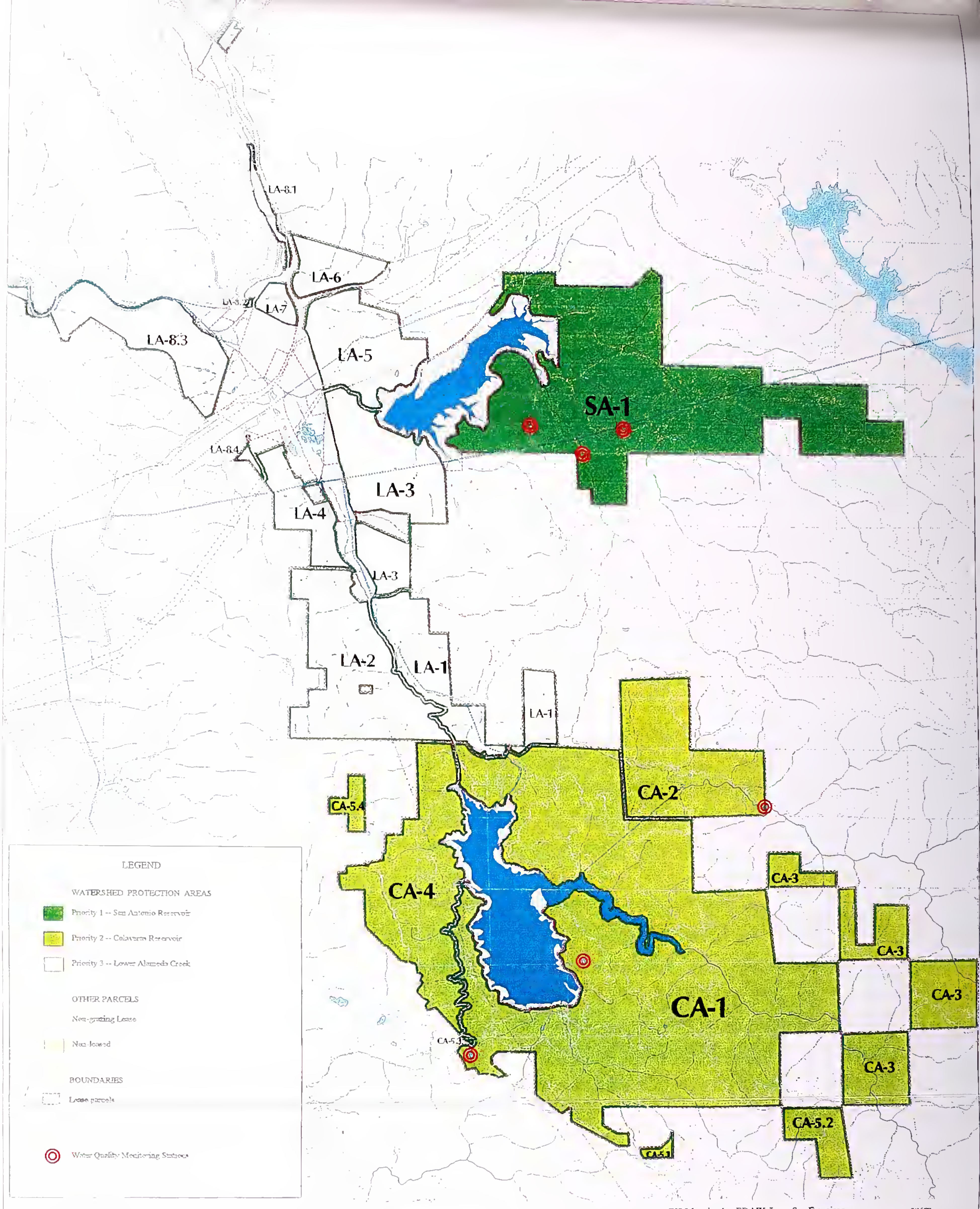
Tables 1, 3 and 5 identify watershed protection improvements for each Watershed Protection Area. These structural improvements are essential for the implementation of this grazing plan. Improvements include fencing to control livestock from entering protected zones; water developments to replace streams currently used as water sources and to attract cattle to all portions of grazing units to achieve greater and more uniform utilization of forage; wildlife ponds to keep feral pigs and tule elk out of reservoirs and streams; and other similar features. The tables identify estimated types, quantities, and costs of these improvements.

San Antonio Watershed Protection Area

This area is the highest priority area to be addressed. Actions for this area will be implemented by November 1, 1997. The area consists of one reservoir, two stream zone buffers, two riparian pastures, and one grazing unit. Improvements for this area are described in Table 1, below. The estimated cost of the required improvements is $540,750. Figure 2 illustrates the improvements proposed for this area.

Table 1: San Antonio Watershed Protection Area Proposed Improvements

Type of Improvement	Number of Units	Unit Measure	Cost Per Unit	Improvement Cost
Fencing	8.91	Miles	$25,000	$222,750
Water Developments	2	Each	$10,000	$20,000
Water Collection systems	3	Each	$30,000	$90,000
Stream Crossings	1	Each	$50,000	$50,000
Wildlife Ponds	3	Each	$36,000	$108,000
Stock Pond Rehabilitation	5	Each	$10,000	$50,000
Total Area Costs				$540,750



Source: Data Compiled by SFWD & ACRCD (1995, 1997) -- subject to field verification

GIS Mapping by EDAW, Inc. - San Francisco

7/15/97

Figure 1

Grazing Resources Management Plan : Priority Areas

Scale 1 : 80,000

Feet 1000 0 2000 4000 6000

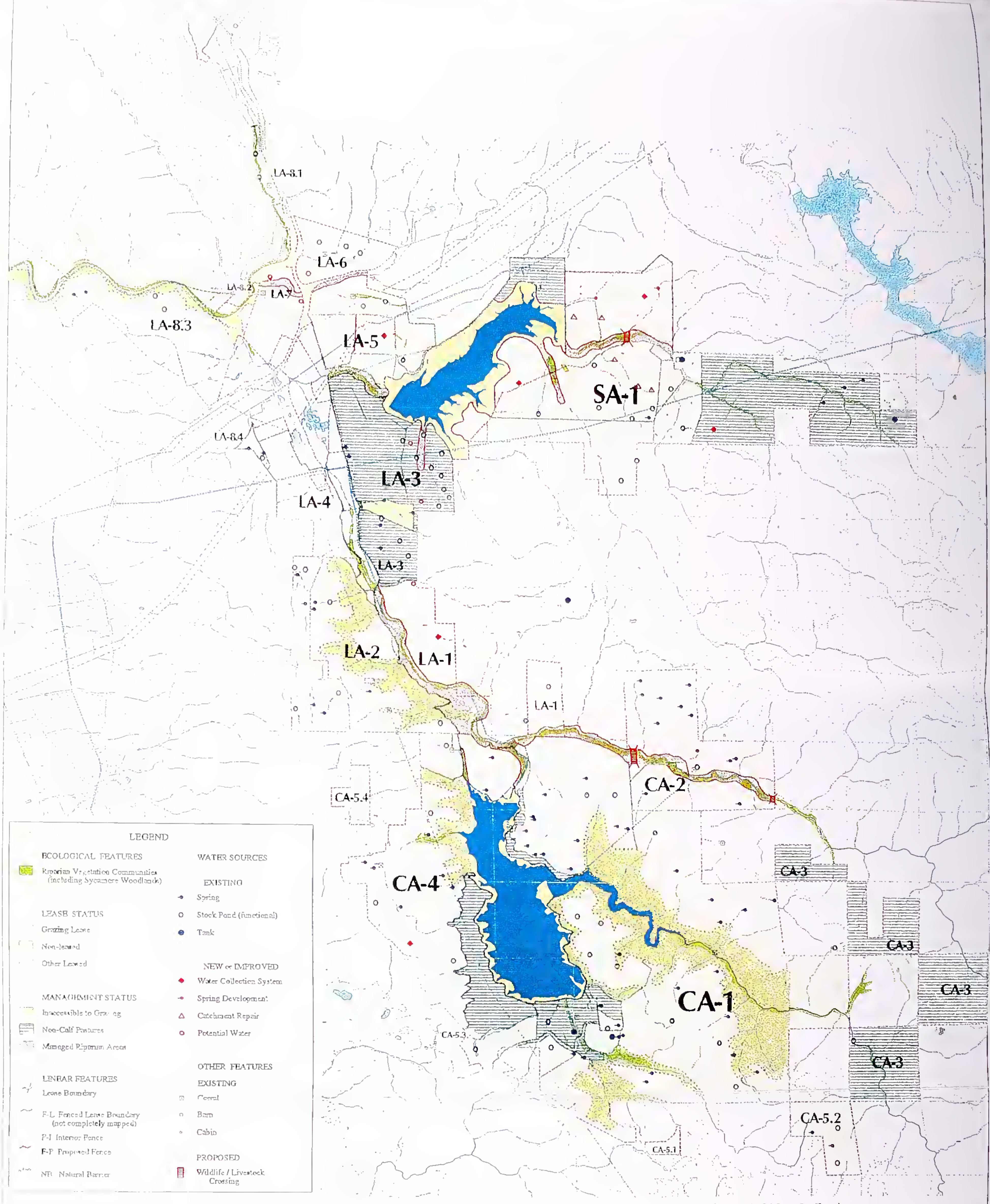
Meters 500 0 1000 2000

1" = 6667 feet

N

ALAMEDA WATERSHED

SAN FRANCISCO WATERSHED MANAGEMENT PLANS



Source: Data Compiled by SFWD & ACRCD (1995, 1997) -- subject to field verification

GIS Mapping by EDAW, Inc. - San Francisco

Figure 2

Grazing Resources Management Plan

Scale 1 : 80,000

Feet 1000 0 2000 4000 6000

Meters 500 0 1000 2000

1" = 6667 feet

ALAMEDA WATERSHED

SAN FRANCISCO WATERSHED MANAGEMENT PLANS

Reservoir Buffers
Stream Zone Buffers

These buffers are not available for livestock grazing of any type. Fenced reservoir and stream buffers will be no less than 300 feet from the high water level of the reservoir or stream. Buffer zone width will be increased as needed for steep slopes (over 30%) and to facilitate fence location. Since there will be no grazing permitted within these buffers, managed vegetation control will be required once every two to three years to control vegetation growth and rodent populations. These buffers are illustrated in Figure 2. In this figure, reservoir buffers are identified as "non-leased areas," and stream buffers are identified at "managed riparian areas."

Riparian Pastures

These pastures are restricted to cows without calves. Two non-calf riparian pasture are established for this area as shown on Figure 2. A portion of the Lower Alameda Creek Watershed Protection Area that lies within the San Antonio hydrologic boundary is also designated as Riparian Pasture. These pastures vary in width and distance away from the reservoir and streams from one to three miles.

Grazing Unit

The San Antonio Watershed Protection Area is limited to one grazing unit. This unit is a consolidation of three former grazing lease areas and will be now be leased as one unit. It is described in Table 2, below and illustrated in Figure 1.

Table 2: San Antonio Watershed Protection Area Grazing Unit

Unit Number	Unit Name	Gross Acres	Estimated AUM's*	Replaces Lease Areas
SA 1	San Antonio Creek	5,830	4,440	Portion of 33, 34, 35

*AUM's may be reduced to account for exclosures and inaccessible areas. This may result in a 10% reduction in AUMs

Calaveras Watershed Protection Area

This is the second priority area where the requirements of this plan will be implemented. Actions for this area will take place by November 1, 1998. The area consists of one reservoir and one stream zone buffer, several inaccessible (too steep for cattle) zones, three riparian pastures, and three general grazing units. The improvements for this area are identified in Table 3, below and illustrated in Figure 2. The estimated cost of the required improvements is $454,500.

Table 3: Calaveras Watershed Protection Area Proposed Improvements

Type of Improvement	Number of Units	Unit Measure	Cost Per Unit	Improvement Cost
Fencing	8.26	Miles	$25,000	$206,500
Water Developments	3	Each	$10,000	$30,000
Water Collection systems	1	Each	$30,000	$30,000
Stream Crossings	1	Each	$50,000	$50,000
Wildlife Ponds	3	Each	$36,000	$108,000
Stock Pond Rehabilitation	3	Each	$10,000	$30,000
Total Area Costs				**$454,500**

Reservoir Buffers
Stream Zone Buffers

These buffers are not available for livestock grazing of any type. Fenced reservoir and stream buffers will be no less than 300 feet from the high water level of the reservoir or stream. Buffer zone width will be increased as needed for steep slopes (over 30%) and to facilitate fence location. Since there will be no grazing permitted within these buffers, managed vegetation control will be required once every two to three years to control vegetation growth and rodent populations. These buffers are illustrated in Figure 2. In this figure, reservoir buffers are identified as "non-leased areas," and stream buffers are identified at "managed riparian areas."

Inaccessible Zones

There are four zones where grazing will not occur due to inaccessibility to extremely steep and rugged terrain as illustrated in Figure 2. Slopes in these areas are in excess of 60-90%. Rock outcrops are common. These zones range in width and distance from the reservoir and streams from 1/4 to one mile.

Riparian Pastures

These pastures are restricted to cows without calves. Three non-calf riparian pastures are established for this area as illustrated in Figure 2. These pastures vary in width and distance away from the reservoir and streams from one to three miles.

Grazing Units

The Calaveras Watershed Protection Area consists of four grazing units, one of which was consolidated from four leases. There is a fifth unit that is an assemblage of four small parcels where the parcel is disjointed from a logical SFPUC grazing lease area and utilization is usually associated with an adjacent landowner's operation. The grazing units are described in Table 4, below and illustrated on Figure 1.

Table 4: Calaveras Watershed Protection Area Grazing Units

Unit Number	Unit Name	Gross Acres	Estimated AUM's*	Replaces Lease Areas
CA 1	Calaveras Creek	363	6,240	45, 47, 50, 60,
CA 2	Frog Pond	1,850	1,140	46
CA 3	Black Mountain	1,963	984	53
CA 4	Mission Peak	2,158	1,260	55
CA 5.1, 5.2, 5.3, 5.4	Miscellaneous	672	504	51, 52, 54, 56

*AUM's may be reduced to account for exclosures and inaccessible areas. This may result in a 10% reduction in AUMs.

Lower Alameda Creek Watershed Protection Area

This is the third and lowest area of priority for implementation. There is some water currently utilized in this portion of the system and greater utilization will be made in two to three years, following completion of a water recapture facility at the head of Sunol Valley, and then in three to five years, and in later years, with the conversion of some gravel quarries to water storage reservoirs. Consequently, this will be the last area where the requirements of this plan will be implemented. Actions for this area will take place by November 1, 1999. The area consists of one extensive stream zone buffer and two lesser ones, two inaccessible (too steep for cattle) zones, two riparian pastures, and seven grazing units. The improvements for this area are identified in Table 5, below, and illustrated in Figure 2. The estimated cost of the required improvements is $470,500.

Table 5: Lower Alameda Creek Watershed Protection Area Proposed Improvements

Type of Improvement	Number of Units	Unit Measure	Cost Per Unit	Improvement Cost
Fencing	6.82	Miles	$25,000	$170,500
Water Developments	2	Each	$10,000	$20,000
Water Collection systems	2	Each	$30,000	$60,000
Stream Crossings	2	Each	$50,000	$100,000
Wildlife Ponds	3	Each	$30,000	$90,000
Stock Pond Rehabilitation	3	Each	$10,000	$30,000
Total Area Costs				**$470,500**

Stream Zone Buffers

These buffers are not available for livestock grazing of any type. Fenced stream buffers will be no less than 300 feet from the high water level of the stream. Buffer zone width will be increased as needed for steep slopes (over 30%) and to facilitate fence location. Since there will be no grazing permitted within these buffer zones, managed vegetation control will be required once every two to three years to control vegetation growth and rodent populations. Stream zone buffers are illustrated in Figure 2 and are referred to in this figure as "managed riparian areas."

Inaccessible Zones

There are two zones were no grazing will occur due to inaccessibility in extremely steep and rugged terrain. Slopes in these zones are in excess of 60-90%. Rock outcrops are common. These zones range in width and distance from the streams from 1/4 to 1 mile. Figure 2 illustrates these inaccessible zones.

Grazing Units

The Lower Alameda Creek Watershed Protection Area consists of seven grazing units, one of which was consolidated from two leases. There is an eighth unit that is an assemblage of seven small parcels where the parcel is disjointed from a logical SFPUC grazing lease area and utilization is usually associated with an adjacent landowner's operation. The grazing units are described in Table 6, below and illustrated in Figure 1.

Table 6: Lower Alameda Creek Watershed Protection Area Grazing Units

Unit Number	Unit Name	Gross Acres	Estimated AUM's*	Replaces Lease Areas
LA 1	Sunol Park	1,316	660	44
LA 2	Sheridon	1,962	1,056	43
LA 3	McGuire Peaks	1,654	960	37
LA 4	Hayes	612	480	42
LA 5	Turner Dam	1,168	1,135	12, 32
LA 6	Sheep Camp	481	480	11
LA 7	Paloma	165	160	13
LA 8.1, 8.2, 8.3, 8.4	Miscellaneous	1,442	1,800	7, 8, 10, 20, 21, 24, 61

*AUM's may be reduced to account for exclosures and inaccessible areas. This may result in a 10% reduction in AUMs.

PROGRAM PHASING

Initially, a large capital investment and some time will be needed to install and construct the structural improvements set forth in this plan. In recognition of this, the Alameda Creek Watershed has been subdivided

into three watershed protection areas as discussed in the previous section and prioritized for implementation of the grazing plan requirements. Figure 1 illustrates the phasing priority of the watershed protection areas. The watershed protection areas and priorities are: Priority 1 - San Antonio; Priority 2 - Calaveras; and Priority 3 - Lower Alameda Creek. The Upper Alameda Creek area is included in the Calaveras Watershed Protection Area because water is diverted from it to Calaveras Reservoir. Implementation of this plan for each of these areas will coincide with the beginning of the lease year on November 1 of 1997, 1998, and 1999 respectively.

WATERSHED MONITORING

Watershed monitoring is required to determine changes in watershed conditions and the effectiveness of the measures set forth in this plan. Monitoring must be done on a regular basis, over time. Ideally, baseline measurements are taken prior to any management actions. Future monitoring then indicates whether the action(s) taken have improved or degraded the watershed over time. Monitoring activities can be listed in two categories: verification of completion of or adherence to program plans and activities, and assessment of program effectiveness. The first category would include verification of development of watershed protection improvements; verification of performance of watershed protection improvement maintenance requirements; and completion and approval of annual operating plans. Examples of the second monitoring program type, monitoring for assessment of program effectiveness are: water quality monitoring; measurements of sedimentation production rates; auditing of tenant financial conditions; and monitoring of changes in vegetative, wildlife habitat and population, threatened and endangered species, and pestilent conditions. Through various monitoring programs, each of these watershed and grazing program elements will be assessed and evaluated to measure compliance and effectiveness of this management plan.

FUNDING OF IMPROVEMENTS

The basic premise of financial responsibilities is that the SFPUC will fund a substantial portion of the costs of improvements. Funding for the first phase of improvements is available in several existing watershed protection programs: fencing, reservoir protection, watershed protection, and vegetation hazard reduction. Increases in future budget years will be made in these projects for phases 2 and 3 improvements. In addition, the SFPUC will apply to one or more of several State Revolving Fund (SRF) Loans available for source water protection, assessment, and monitoring. Possible SRF Loan sources include the Clean Water Act (CWA) SRF, the newly created Safe Drinking Water Act (SDWA) SRF to be implemented this year, and the Cal-Fed Bay-Delta Funds. Through the use of SRF Loans, the major improvements identified can be funded for construction, then the debt would be serviced over a 20-year period at low interest rates; usually 2%.

SFPUC funding will be directed to another agency, such the Alameda County Resources Conservation District, for actual installation and construction of the improvements. The advantage of this approach is that the specifications for the types of improvements required are generally available within the resources of the secondary agency. In addition, consolidation of the construction activities under one agency will be more efficient in terms of contract administration and performance.

Some work will also be accomplished by the tenants through a work-credit provision in the individual leases. This funding method is generally limited to 50% of the annual lease fee.

APPENDIX I

SAMPLE DRAFT GRAZING LEASE

CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION

WATER SUPPLY AND TREATMENT DIVISION

CATTLE GRAZING LEASE

Table of Contents

Section **Page**

1 BASIC LEASE INFORMATION 1
2 DEFINITIONS 3
3 PREMISES 7
4 TERM 9
5 RENT 9
6 TAXES, ASSESSMENTS AND OTHER EXPENSES 11
7 GRAZING CAPACITY 12
8 USE; COVENANTS TO PROTECT PREMISES AND CITY FACILITIES 14
9 IMPROVEMENTS 17
10 GRAZING METHOD 18
11 MAINTENANCE 20
12 LIENS 22
13 COMPLIANCE WITH LAWS 22
14 DAMAGE OR DESTRUCTION 23
15 EMINENT DOMAIN 24
16 ASSIGNMENT AND SUBLETTING 25
17 DEFAULT; REMEDIES 26
18 INDEMNIFICATION 28
19 INSURANCE 29
20 ACCESS BY CITY 32
21 ESTOPPEL CERTIFICATES 33
22 SURRENDER 33
23 HAZARDOUS MATERIALS 34
24 SECURITY DEPOSIT 35
25 GENERAL PROVISIONS 36

LIST OF EXHIBITS

EXHIBIT A -- Real Property Description
EXHIBIT B -- Drawing of Premises
EXHIBIT C -- Monuments
EXHIBIT D -- Cost Schedule
EXHIBIT E -- Form of Grazing Report

CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION
WATER SUPPLY AND TREATMENT DIVISION

CATTLE GRAZING LEASE

THIS CATTLE GRAZING LEASE, dated for reference purposes as of _______ __, 1997 ("**Lease**"), is by and between **CITY AND COUNTY OF SAN FRANCISCO**, a municipal corporation, acting through its Public Utilities Commission ("**City**") and _________________ ("**Tenant**").

1. BASIC LEASE INFORMATION

The following is a summary of basic lease information (the "**Basic Lease Information**"). Each item below shall be deemed to incorporate all the terms set forth in this Lease pertaining to such item. In the event of any conflict between the information in this Article and any more specific provision of this Lease, the more specific provision shall control.

Lease Reference Date:	
Landlord:	CITY AND COUNTY OF SAN FRANCISCO
Tenant:	
Premises (Section 3.1):	_________________ located in ______ County, California, owned by City and under the jurisdiction of its Public Utilities Commission, Water Department, as more particularly described in Exhibit A.
Term (Section 4.1):	Commencement Date: Expiration Date:
Base Rent (Section 5.1):	Annual Base Rent: \$ Semiannual payments: \$
Base Grazing Capacity (Section 7.1)	Parcel: _____: _____ AUMs Parcel: _____: _____ AUMS
Use (Section 8.1):	Cattle grazing

Security Deposit (Article 24): $

Notice Address of City (Section 25.1):

San Francisco Public Utilities Commission
Water Supply and Treatment Division
1000 El Camino Real
P.O. Box 730
Millbrae, CA 94030
Attn: Real Property Manager
Fax No.: (415) 872-5975

with a copy to:

Office of the City Attorney
Fox Plaza
1390 Market Street, Suite 250
San Francisco, CA 94102
Attn: Utilities General Counsel
Fax No.: (415) 554-9711

Key Contact for City: Tim Koopmann

Telephone No.: (510) 862-2233

Alternate Contact for City: William H. Laws

Telephone No.: (415) 771-4421

Notice Address of Tenant (Section 25.1):

Key Contact for Tenant:

Telephone No.:

Alternate Contact for Tenant:

Telephone No:

2 DEFINITIONS

For purposes of this Lease, initially capitalized terms shall have the meanings ascribed to them in this Section or elsewhere in this Lease:

"**Actual Costs**" means the sum of: (i) direct labor costs and (ii) direct material costs, when Tenant has incurred such costs directly in the performance of any item of Long-Term Maintenance approved or directed by City and where such materials fulfill all specifications as determined by City. When Tenant contracts with third parties for performance of any items of Long-Term Maintenance, "Actual Costs," as used herein shall mean the amount of such contracts negotiated on an arms-length basis as shall have been approved in advance and in writing by City. All cost should adhere with the guidelines set forth in the cost schedule attached hereto as Exhibit D.

"**Additional Charges**" means any and all personal property taxes, possessory interest taxes and other costs, impositions and expenses described in Article 6 hereof or otherwise payable by Tenant under this Lease.

"**Agents**" means, when used with reference to either Party to this Lease, the officers, directors, employees, agents and contractors of such party, and their respective heirs, legal representatives, successors and assigns.

"**Alterations**" means any alterations, installations or additions to any Improvements or to the Premises.

"**Assignment**" has the meaning given in Section 16.1 hereof.

"**Animal Unit Month**" or "**AUM**" means the amount of forage (equivalent to 800 lbs. of dry matter) required by a mature cow for a period of one month.

"**Award**" means all compensation, sums or anything or value paid, awarded or received for a Taking, whether pursuant to judgment, agreement, settlement or otherwise.

"**Basic Lease Information**" means the information with respect to this Lease summarized in Article 1 hereof.

"**Base Grazing Capacity**" means the grazing capacity specified in the Basic Lease Information and described in Section 7.1 hereof.

"**Base Rent**" means the annual Base Rent specified in the Basic Lease Information and described in Section 5.1 hereof.

"**City**" means the City and County of San Francisco, a municipal corporation, and all of its boards, commissions, departments, agencies and other subdivisions, including the Public Utilities Commission.

"**City Facilities**" means any and all water pipelines, roads, culverts, drainage pipelines, hatch covers, wells, dams, tunnels, reservoirs, basins and other surface and subsurface utility facilities now or later located in, under, on or about the Premises for the transportation or distribution of water for municipal purposes, together with all appurtenances thereto and all monuments thereof.

"**Commencement Date**" means the commencement date specified in the Basic Lease Information.

"**Date of Taking**" means the earlier of (i) the date upon which title to the portion of the Property taken passes to and vests in the condemnor or (ii) the date on which Tenant is dispossessed.

"**Effective Date**" has the meaning given in Section 25.27 hereof.

"**Environmental Laws**" means any present or future federal, state or local Laws or policies relating to Hazardous Material (including, without limitation, its use, handling, transportation, production, disposal, discharge or storage) or to human health and safety, industrial hygiene or environmental conditions in, on, under or about the Premises, including, without limitation, water, soil, air and groundwater conditions.

"**Event of Default**" means any one of the events of default described in Section 17.1 hereof.

"**Grazing Plan**" means the annual operating plan required to be prepared by Tenant and submitted to City as set forth in Section 10.1 hereof.

"**Grazing Report**" means the grazing report in substantially the form attached hereto as Exhibit E.

"**Hazardous Material**" means any material that, because of its quantity, concentration or physical or chemical characteristics, is deemed by any federal, state or local governmental authority to pose a present or potential hazard to human health or safety or to the environment. Hazardous Material includes, without limitation, any material or substance defined as a "hazardous substance," or "pollutant" or "contaminant" pursuant to the Comprehensive Environmental Response, Compensation and Liability Act of 1980 ("CERCLA", also commonly known as the "Superfund" law), as amended, (42 U.S.C. Sections 9601 et seq.) or pursuant to Section 25281 of the California Health & Safety Code; any "hazardous waste" listed pursuant to Section 25140 of the California Health & Safety Code; any asbestos and asbestos containing materials whether or not such materials are part of the structure of any existing Improvements on the Land, any Improvements to be constructed on the Land by or on behalf of Tenant, or are naturally occurring substances on, in or about the Land; and petroleum, including crude oil or any fraction thereof, and natural gas or natural gas liquids.

"**Hazardous Material Claims**" means any and all enforcement, Investigation, Remediation or other governmental or regulatory actions, agreements or orders threatened, instituted or

completed pursuant to any Environmental Laws, together with any and all Losses made or threatened by any third party against City, the PUC, their Agents, or the Premises relating to damage, contribution, cost recovery compensation, loss or injury resulting from the presence, release or discharge of any Hazardous Materials, including, without limitation, Losses based in common law. Hazardous Materials Claims include, without limitation, Investigation and Remediation costs, fines, natural resource damages, damages for decrease in value of the Premises, the loss or restriction of the use or any amenity of the Premises and attorneys' fees and consultants' fees and experts' fees and costs.

"Improvements" means any and all corrals, fences, structures, structural range improvements, sanitary facilities improvements and other improvements constructed, installed or placed on the Premises by or on behalf of Tenant pursuant to this Lease, including, without limitation, any trailers, mobile homes, permanent tent facilities, signs, roads, trails, driveways, parking areas, plantings and landscaping.

"Indemnify" means indemnify, protect, defend and hold harmless forever.

"Indemnified Parties" has the meaning given in Section 18.2 hereof and each of them.

"Investigation" means any activity undertaken to determine the nature and extent of Hazardous Materials that may be located in, on, under or about the Property or any portion thereof or which have been, are being, or threaten to be Released into the environment. Investigation shall include, without limitation, preparation of site history reports and sampling and analysis of environmental conditions in, on, under or about the Property.

"Invitees" when used with respect to Tenant means the clients, customers, invitees, guests, members and licensees, assignees and subtenants of Tenant.

"Land" means the real property described in the attached Exhibit A.

"Landlord" means the City and County of San Francisco.

"Law" means any law, statute, ordinance, resolution, regulation, proclamation, order or decree of any municipal, county, state or federal government or other governmental or regulatory authority with jurisdiction over the Premises or any portion thereof.

"Lease" means this Lease as it may be amended in accordance with its terms.

"Lease Year" means each twelve (12) consecutive month period during the Lease Term, with the first period commencing on the Commencement Date.

"Livestock" has the meaning given to such term in Section 7.2(a) hereof.

"Long-Term Maintenance" as used herein, shall mean any item of protection, preservation, maintenance and repair of the Premises or any part thereof, including property and

any appurtenant facilities used by the Tenant in common with others, the recurrence of which is not anticipated within the twelve (12) month period following its completion. Long-Term Maintenance does not include any item of protection, maintenance or repair which is solely incidental to Tenant's use of the Premises and which Tenant is obligated to perform under routine maintenance or any other provision of this Lease.

"**Losses**" means any and all claims, demands, losses, liabilities, damages, liens, injuries, penalties, fines, lawsuits and other proceedings, judgments and awards and costs and expenses, including, without limitation, reasonable attorneys' and consultants' fees and costs.

"**Maximum Grazing Capacity**" means the maximum amount of AUMs possible on a parcel without inducing damage to vegetation or related resources, which may vary from year to year as determined by the City.

"**Official Records**" means the official records of the county(ies) in which the Premises are located.

"**Party**" means City or Tenant, or both if plural.

"**Premises**" has the meaning given in Section 3.1 hereof.

"**PUC**" means the Public Utilities Commission of the City and County of San Francisco.

"**Real Property Manager**" means the Watershed Manager of the Water Supply and Treatment Division Land Section of the PUC.

"**Release**" when used with respect to Hazardous Material means any actual or imminent spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into or inside any existing improvements or any Improvements constructed hereunder by or on behalf of Tenant, or in, on, under or about the Premises, Improvements or City facilities or any portion thereof.

"**Remediation**" when used with reference to Hazardous Material means any activities undertaken to clean up, remove, contain, treat, stabilize, monitor, mitigate or otherwise control Hazardous Materials located in, on, under or about the Premises or City Facilities or existing improvements on the Land, or which have been, are being, or threaten to be Released into the environment. Remediation includes, without limitation, those actions included within the definition of "remedy" or "remedial action" in California Health and Safety Code Section 25322 and "remove" or "removal" in California Health and Safety Code Section 25323.

"**Residual Dry Matter**" or "**RDM**" means the amount of standing dead plant material and litter from herbaceous plants, expressed in pounds per acre.

"**Sublease**" has the meaning given in Section 16.1 hereof.

"Taking" means a taking or damaging, including severance damage, by eminent domain, inverse condemnation or for any public or quasi-public use under Law. A Taking may occur pursuant to the recording of a final order of condemnation, or by voluntary sale or conveyance in lieu of condemnation or in settlement of a condemnation action.

"Tenant" means the Party identified as Tenant in the Basic Lease Information and at the beginning of this Lease. Except when immediately followed by the word "itself," the term Tenant shall also refer to the successors and assigns of Tenant's interests under this Lease, provided that the rights and obligations of Tenant's successors and assigns shall be limited to only those rights and obligations that this Lease permits to be Transferred and that have been Transferred in accordance with this Lease.

"Tenant's Personal Property" means the personal property of Tenant described in Section 9.3 hereof.

"Term" or **"Lease Term"** means the term of this Lease as determined under Section 4.1 hereof.

"Transfer" means any Assignment or Sublease.

"Transferee" means any recognized assignee of any part of Tenant's leasehold interest hereunder or any recognized subtenant of any portion of the Premises, pursuant to a Transfer that complies with Article 16 hereof.

"Unmatured Event of Default" means any Event of Default that, with the giving of notice or the passage of time, or both, would constitute an Event of Default hereunder.

3. PREMISES

3.1 **Premises**. Subject to the terms, covenants and conditions of this Lease, City hereby leases to Tenant that certain real property situated in the County of __________, State of California, consisting approximately of _______ acres as more particularly described in Exhibit A attached hereto (the **"Premises"**); excluding therefrom and reserving unto City, its successors and assigns, the City Facilities and any and all the rights of access provided for in Article 20 below and the other rights described in Section 3.2 below. The Premises are shown generally on Drawing Nos. ____________, copies of which are attached hereto as Exhibit B. Any acreage stated in this Lease with respect to the Premises is an estimate only, and City does not warrant it to be correct. However, the Parties agree that for all purposes of this Lease, any such acreage shall be deemed to be correct. Nothing in this Lease is intended to grant Tenant any rights to possession, use or operation of the City Facilities.

3.2 Reserved Rights

(a) **Water and Timber Rights**. City reserves and retains for itself and its successors or assigns ownership of all timber, all standing trees, and downed timber on the

Premises and all rights to surface water, percolating water and groundwater within the Premises. However, Tenant may use on the Premises any water upon the Premises for domestic purposes, watering stock and other natural uses subject to the terms and conditions hereof. Tenant's foregoing right shall not include water within City Facilities reserved for municipal use.

(b) **Pipelines and Watershed Management**. City reserves and retains for itself and all its successors or assigns the right to use or cause to be used all or any portion of the Premises for the purpose of: planting and caring for trees, wildlife habitat enhancement, soil conservation, constructing erosion control structures, cutting and hauling of wood, construction, maintenance, and the use of roads, railroads, trenches, ditches, pipelines, tunnels, electric power transmission lines, and/or telecommunications lines and facilities, wind power generation, quarrying and using rock, gravel, and minerals, and also the right to do any kind of construction, development work and watershed protection and maintenance on the Premises and to occupy such portion thereof as may be suitable or convenient for any of such purposes.

(c) **Minerals, Oil and Gas**. City does hereby reserve and retain for itself and its successors and assigns all rights to prospect for and develop upon, extract and remove from the Premises `all minerals, oil, and gas, together with the right of ingress to and egress from the Premises over the most convenient routes for said purposes. City does hereby further reserve the right at any time to withdraw from the operation of this Lease, in the manner and as provided for by Section 3.4 hereof, the whole or any portion of the Premises required by City or its successors or assigns for any of the purposes specified in this paragraph.

(d) **Roads**. City does also hereby reserve for the joint use of itself, its employees, Agents, permittees, successors and assigns, and Tenant, any and all roads, trails, paths, and ways upon or across the Premises. City does also reserve the right at any time to establish rights of way across the Premises for hiking and riding trails or other controlled or permitted uses. City agrees to maintain all roads, trails, paths and ways upon or across the Premises.

3.3 As Is Condition of Premises.

(a) Tenant represents and warrants that Tenant has conducted a thorough and diligent inspection and investigation, either independently or through agents of Tenant's own choosing, of the Premises and the suitability of the Premises for Tenant's intended use. Tenant is fully aware of the needs of its operations and has determined, based solely on its own investigation, that the Premises are suitable for its operations and intended uses.

(b) Tenant acknowledges and agrees that the Premises are being leased and accepted in their "AS IS, WITH ALL FAULTS" condition, without representation or warranty of any kind, and subject to all applicable Laws governing the use, occupancy, management, operation and possession of the Premises. Without limiting the foregoing, this Lease is made subject to any and all covenants, conditions, restrictions, easements and other title matters affecting the Premises, or any portion thereof, whether or not of record. Tenant acknowledges and agrees that neither City nor the PUC, including without limitation nor any of their Agents, have made, and City hereby disclaims, any representations or warranties, express or implied, concerning (i) title or survey

matters affecting the Premises, (ii) the physical, geological or environmental condition of the Premises, (iii) the present or future capacity or suitability of the Premises for cattle grazing, (iv) the feasibility, cost or legality of constructing any Improvements on the Premises if required for Tenant's use and permitted under this Lease, the condition of any fences, roads, gates or range improvements, or (v) any other matter whatsoever relating to the Premises or their use, including, without limitation, any implied warranties of merchantability or fitness for a particular purpose.

3.4 **Withdrawal of Premises**. City reserves the right at any time to reduce the Premises by any position thereof which City may transfer, sell or contract to sell or transfer or which may be devoted to or required for a public use or purpose, including range and watershed improvement or repair, water facilities maintenance and construction, wildlife enhancement and those uses set forth in any watershed plan implemented or adopted by City, upon giving Tenant ninety (90) days prior written notice of its intention to do so. City reserves the right to withdraw from the operation of this Lease at any time and in any manner the whole or any portion of the Premises, the use of which by Tenant may result in damage by erosion, pollution or otherwise, directly or indirectly, to the reservoirs, water courses, dams, works or operations of City. The Parties acknowledge and agree that if the withdrawal of a portion of the Premises does not alter the then current Base Grazing Capacity, Base Rent shall remain the same. However, if the City reduces the Base Grazing Capacity, Base Rent shall be adjusted pursuant to Section 5.2 hereof.

4. TERM

4.1 **Term of Lease**. The Premises are leased for a term (the "**Term**") beginning on the Commencement Date in the Basic Lease Information. The Lease Term shall end on the Expiration Date specified in the Basic Lease Information, unless sooner terminated pursuant to the provisions of this Lease.

4.2 **Commencement Date and Expiration Date**. The dates on which the Term commences and terminates pursuant hereto are referred to respectively as the "**Commencement Date**" and the "**Expiration Date**."

5. RENT

5.1 **Base Rent**. During the Lease Term, the Tenant shall pay to City annual rent in the amount of ____________________ ($__________) ("**Base Rent**"). Base Rent shall be payable in equal quarterly installments due on ________ __, __________ __, ________ __, and __________ __ of each year (each a "**Payment Date**"). The Base Rent shall be paid in advance, without prior demand and without any deduction, setoff or counterclaim whatsoever. All sums payable by Tenant to City hereunder shall be paid in cash or good check to the San Francisco Public Utilities Commission in care of PUC Finance at 1155 Market Street, 5th Floor, San Francisco, California 94102 or such other place as the City may designate in writing. The first semiannual installment shall be paid on the Commencement Date. If the Commencement Date is not a Payment Date, Base Rent for such fractional period shall be prorated based on a one hundred eighty (180) day semiannual period. The Base Rent shall be paid in full when due and payable regardless of whether or not any livestock are grazed upon the Premises or whether or not any lesser number of AUMs of grazing have been

consumed than has been authorized. Notwithstanding all terms and conditions in this Lease, the total rent payable for the period of ___________ __, 199_ through ____________ __, ____ shall be __________________________ ($________).

5.2 Adjustment of Base Rent.

(a) Tenant and City acknowledge that the Base Rent is based on the total Base Grazing Capacity (expressed in AUMs) for the Premises. City and Tenant agree that each AUM shall be valued at ____________($______). Should Tenant and City agree in writing to either increase or decrease the Base Grazing Capacity during the Term pursuant to Section 7.4 the Parties agree that the Base Rent shall be adjusted to reflect such change. For purposes of calculating the appropriate adjustment to the Base Rent, the Parties shall multiply the number of AUMs which the Base Grazing Capacity has been increased or decreased by ________________ ($______). The product shall constitute the amount by which the Base Rent shall be adjusted.

(b) In the event of an increase in Base Grazing Capacity during any semiannual period, the Base Rent to cover such increase for the remainder of the such period shall be due and payable with the next semiannual installment payment. In the event of a decrease in the Base Grazing Capacity, the reduction in the Base Rent shall be credited against the next semiannual installment payment. If the adjustment in the Base Grazing Capacity occurs during the last six months of the Lease Term, the debtor Party shall pay the requisite amount on the effective date of the change in the Base Grazing Capacity

5.3 **Late Charge**. If Tenant fails to pay any Base Rent within five (5) days after the date the same is due and payable, such unpaid amount will be subject to a late payment charge equal to six percent (6%) of the unpaid amount in each instance. The late payment charge has been agreed upon by City and Tenant, after negotiation, as a reasonable estimate of the additional administrative costs and detriment that City will incur as a result of any such failure by Tenant, the actual costs thereof being extremely difficult if not impossible to determine. The late payment charge constitutes liquidated damages to compensate City for its damages resulting from such failure to pay and shall be paid to City together with such unpaid amount.

5.4 **Livestock Lien**. Tenant thereby acknowledges that all Base Rent and Additional Charges not paid when due and payable hereunder shall become a lien on any and all livestock located on the Premises as prescribed by California Civil Code Section 3080, et seq. and City shall have the right to take possession and retain all cattle until all unpaid amounts are satisfied in full.

5.5 **Default Interest**. Any Base Rent, if not paid within five (5) days following the due date, shall bear interest from the due date until paid at the rate of ten percent (10%) per year or, if a higher rate is legally permissible, at the highest rate an individual is permitted to charge under Law. However, interest shall not be payable on late charges incurred by Tenant nor on any amounts on which late charges are paid by Tenant to the extent this interest would cause the total interest to be in excess of that which an individual is lawfully permitted to charge. Payment of interest shall not excuse or cure any default by Tenant.

6. TAXES, ASSESSMENTS AND OTHER EXPENSES

6.1 Taxes and Assessments, Licenses, Permit Fees and Liens.

(a) **Payment of Taxes and Other Changes**. Tenant shall pay any and all personal property taxes, general and special assessments, excises, licenses, permit fees and other charges and impositions of every description levied on or assessed against the Premises, any Improvements installed by or on behalf of Tenant on the Premises, Tenant's Personal Property, the leasehold estate or any subleasehold estate, or Tenant's use of the Premises or any other portion of the Improvements permitted hereunder. Tenant shall make all such payments directly to the charging authority when due and payable and at least ten (10) days prior to delinquency, subject to Tenant's right to contest the validity of such charge pursuant to subsection (c) below.

(b) **Possessory Interest**. Without limiting the foregoing, Tenant recognizes and agrees that this Lease may create a possessory interest subject to property taxation and that Tenant may be subject to the payment of property taxes levied on such interest.

(c) **No Liens**. Tenant shall not allow or suffer a lien for any taxes payable by Tenant hereunder to be imposed upon the Premises or upon any equipment, livestock or other property located thereon without promptly discharging the same. Tenant may have a reasonable opportunity to contest the validity of any such taxes provided Tenant, before commencement of any proceeding or contest, furnishes to City a surety bond issued by a surety company qualified to do business in California and acceptable to City's Controller. The amount of such bond shall be equal to one hundred twenty five percent (125%) of the amount of taxes in dispute and shall be in such form as approved by the City Attorney. The bond shall insure payment of any judgment that may be rendered should Tenant be unsuccessful in any such contest. Tenant shall Indemnify City, the other Indemnified Parties, and the Premises from and against any Losses arising out of any proceeding or contest provided for hereunder. The foregoing Indemnity shall not be limited by the amount of the bond.

(d) **Tax Information**. Tenant agrees to provide such information as City may request to enable City to comply with any tax reporting requirements applicable to this Lease.

6.2 **Other Expenses**. Tenant shall be responsible for any and all other charges, costs and expenses related to its use, occupancy, operation or enjoyment of the Premises or any Improvements permitted thereon, including, without limitation, the cost of any utilities or services necessary for Tenant's use.

6.3 **Evidence of Payment**. Tenant shall, upon City's request, furnish to City within ten (10) days after the date when any charges are due and payable, official receipts of the appropriate taxing authority or other evidence reasonably satisfactory to City, evidencing payment thereof.

7. GRAZING CAPACITY

7.1. Base Grazing Capacity.

(a) The Base Grazing Capacity during the first Lease Year for each parcel located within the Premises is as follows:

Parcel ________, __________ AUMs

The foregoing Base Grazing Capacity shall remain the same for each subsequent Lease Year unless City sends Tenant a written notice thirty (30) days prior to the commencement of the Lease Year, and specifies in such notice the new Base Grazing Capacity for the affected parcel.

7.2 Relative Forage Requirements.

(a) Computation of AUMs. For the purpose of computing the consumption of the authorized available forage in AUMs, the relative feed requirements of the various kinds of livestock permitted to be kept on the Premises shall be deemed to be as follows, expressed as an animal-unit conversion factor:

LIVESTOCK TABLE

TYPE OF LIVESTOCK	ANIMAL-UNIT CONVERSION FACTOR
Calf (6 months to Short Yearling up to 750#)	0.50
Yearling to 2 Year Old (750# to 1000#)	0.75
Cow or Cow and Calf (Calf until August 1)	1.00
Bull	1.25

(b) Effective Date for Changed AUM. As the types of livestock increase in weight during any Lease Year, the new factor shall be effective upon the date on which the change in weight is determined to have occurred.

7.3 City Is Sole Judge of Maximum Grazing Capacity. City shall be the sole judge as to the Maximum Grazing Capacity of the Premises and any parcels thereof, and the determination of the Real Property Manager, as to the Maximum Grazing Capacity and as to the number of AUMs available at any and all times for use by Tenant on the Premises and any parcels thereof and the authorization for use thereof by Tenant shall be binding and conclusive upon the Parties. In determining the Maximum Grazing Capacity of the Premises or any parcels thereof, City may take into account, by way of example only and without limitations such factors as erosion control, reforestation, native vegetation, water quality, fisheries, wildlife, recreation or other conditions or uses that may affect the use, operation, and conservation of its watershed, lands, and reservoirs. Notwithstanding any other provision, the maximum grazing capacity shall not exceed forty percent (40%) of pre-1991 stocking levels.

7.4 Changing Base Grazing Capacity By Mutual Consent. The Parties may change the Base Grazing Capacity by mutual written agreement. Any such agreement shall remain in effect until the beginning of the next Lease Year, unless sooner terminated or amended by further

mutual written agreement. In the event that the Maximum Grazing Capacity determined pursuant to Section 7.4 is lesser than the Base Grazing Capacity, the Base Grazing Capacity shall automatically be reduced to equal the Maximum Grazing Capacity. Under any such automatic reduction or agreement, the Base Rent for the Premises shall be adjusted pursuant to Section 5.2 hereof.

7.5 **Emergency Reduction of Base Grazing Capacity**. At any time and from time to time, the Real Property Manager may reduce the Base Grazing Capacity or impose a full or partial grazing moratorium in his or her discretion when such action is necessary or appropriate for the conservation of the watershed lands. The reduction shall be expressed in writing, and shall be implemented by the Tenant within thirty (30) days. In implementing such reduction, Tenant may either (i) reduce animal numbers, or (ii) feed hay of good quality at the equivalent of three (3) AUMs per ton fed. In the event Tenant desires to use option (ii), Tenant shall first obtain City prior written approval. In giving such approval, City may require Tenant to concentrate all or part of the livestock into selected areas for feeding and control and Tenant shall provide suitable documentation for the amounts of hay fed, which shall be included with Tenant's next monthly Grazing Report. In the event of such reduction, the Base Rent shall be adjusted pursuant to Section 5.2 hereof.

7.6 **Exceeding Base Grazing Capacity Without Authorization**. The Premises shall be used by Tenant only for grazing the types of animals specified in the Livestock Table in Section 7.2 hereof. Tenant shall limit the number of livestock to be grazed upon the Premises and the period of their grazing so that the authorized number of AUMs shall not be exceeded. Should the Premises be grazed in excess of the authorized number of AUMs, Tenant shall within ten (10) days of receipt of written notice from the City remove such number of livestock necessary to comply with the current Base Grazing Capacity authorized hereunder. In addition to all other rights City may have or exercise under this Lease, Tenant shall pay to City promptly upon demand Twenty-four Dollars and Sixty Cents ($24.60) for each AUM or portion thereof grazed in excess of the authorized number. Tenant hereby acknowledges and agrees that such amount is the minimum damage to City from such excess usage. The foregoing amount has been agreed upon by City and Tenant, after negotiation, as a reasonable estimate of the additional administrative costs and detriment that City will incur as a result of any such failure by Tenant the actual costs thereof being extremely difficult if not impossible to determine. The amount constitutes liquidated damages to compensate City for its damages resulting from such failure to pay and shall be paid to City together with such unpaid amount.

7.7 **Reporting Livestock Information**. Tenant shall submit an accurate monthly accounting of operation upon the Premises in the monthly Grazing Report in substantially the form attached hereto as Exhibit E. Such report shall be filled out and submitted to City no later than the fifteenth (15th) day of the month following the period covered by the report. Tenant further agrees to supply to City in the monthly Grazing Report verification of the quantity of supplemental feed used and the number, type and weights of livestock which Tenant had upon the Premises during the period covered by said report. In addition to the foregoing, a copy of the original weights-in and weights-out slips shall be attached to the monthly Grazing Report which covers feeder cattle being moved onto or off the Premises. All documentation of livestock information required of the Tenant

by City, must be certified as true and correct, signed and dated by Tenant or authorized agent of Tenant, prior to submittal to City.

8. USE; COVENANTS TO PROTECT PREMISES AND CITY FACILITIES

8.1 **Tenant's Permitted Use**. Tenant may use the Premises for the use specified in the Basic Lease Information, and for no other purpose.

8.2 **Covenants Regarding Use**. As a material inducement to City to enter into this Lease, Tenant covenants with City as follows:

(a) **Overgrazing; Residual Dry Matters**. Tenant agrees not to permit the Premises to be overgrazed. A layer of RDM shall be maintained by Tenant to minimize soil erosion and enhance both the quality and quantity of forage produced. The target amount of RDM for the unit, as measured by City on September 1, shall be 1,000 Lbs/Acre. At no time shall the Tenant allow the RDM to drop below 800 Lbs for any given acre. The Parties acknowledge that localized over-utilization will occur adjacent to watering facilities, corrals, and salting areas. As such, these areas will not be used to determine the RDM levels of a pasture. If the RDM levels drop below the amounts specified above, City shall notify Tenant, and Tenant shall immediately remove all livestock from the affected pasture(s) until such time as City determines that such pasture(s) have recovered sufficiently for restocking.

(b) **Health of Livestock**. Tenant covenants and warrants that all livestock to be located on Premises shall be in general good health, physical condition and have been inoculated with all appropriate vaccinations according to good husbandry practice.

(c) **Herd Health Program**. Tenant shall develop a herd health program for the prevention and care of general parasitic disease, to maintain healthy immune systems and minimize diarrheal infection.

(d) **Dead Livestock; Disease**. Tenant shall lime, bury or remove any livestock that dies on or near the Premises. Upon discovering any dead livestock on or near the Premises, Tenant shall immediately notify City. In such notice, Tenant shall state its proposed method for disposing of the dead livestock. The proposed method shall be subject to approval by City. Tenant shall immediately report any case of infectious animal to the proper governmental or regulatory authorities, and to City, and take adequate steps to isolate, control and eliminate any such disease.

(e) **Fences**. Tenant shall repair and maintain all
existing fences (including gates) in a livestock-tight condition acceptable to City. From time to time City can require Tenant to construct fences necessary to protect the watershed.

(f) **No Unlawful Uses**. Tenant shall not use or occupy any of the Premises or any Improvements, or permit the use or occupancy thereof, in any unlawful manner or for any illegal purpose. Tenant shall take all precautions to eliminate immediately any hazards relating to its activities on or about the Premises.

(g) **Covenant Against Waste**. Tenant shall not cause or permit any waste, damage or injury to the Premises or any other part of the Improvements or City Facilities.

(h) **Covenant to Protect City Facilities**. At all times during the Lease Term, Tenant shall protect the City Facilities from any damage, injury or disturbance. If Tenant or any of its Agents or Invitees damages, injures or disturbs any of the City Facilities, or any portion of the City Facilities (including monuments), Tenant shall immediately notify City of that occurrence. City may, without limiting any of its other rights hereunder, take all actions it deems proper to repair such City Facilities (including replacement or relocation of monuments) at Tenant's sole expense.

(i) **Covenant Against Impairment of Water Courses; Ponding**. Except for those existing stock ponds that City has designated that Tenant can use for its grazing operation, Tenant shall not engage in any activity that causes any change, disturbance, fill, alteration or impairment to the bed, bank or channel of any natural water course whether wet or dry, wetland, or other body of water on, in, under or about the Premises, nor shall Tenant engage in any activity that would pollute or degrade any surface or subsurface waters or result in the diminution or drainage of such waters. Any maintenance to be performed on any existing stock ponds must be approved in writing by City. Tenant shall not cause any ponding on the Premises or any flooding on adjacent land.

(j) **Covenant Against Dumping**. Tenant shall not cause or permit the dumping or other disposal on, under or about the Premises of landfill, refuse, Hazardous Material or other materials that are unsightly or could pose a hazard to the human health or safety, native vegetation or wildlife, or the environment.

(k) **Covenant Against Hunting or Fishing**. Tenant shall not engage in or permit any hunting, trapping or fishing on or about the Premises, except for hunting or trapping for the purpose of controlling predators or problem animals by the appropriate use of selective control techniques approved in advance by the City provided such hunting and trapping is done in strict accordance with all applicable Laws. Whenever possible, all measures used for such control shall be limited in their application to the specific problem animals. Tenant shall not use cyanide guns, traps or other similar non-selective control techniques. Tenant shall not use poison bait unless approved by the County Agricultural Commissioner of the county where the Premises are located. In no event may Tenant use any prophylactic predator control measures.

(l) **Covenant Against Use of Chemical Herbicides and Pesticides**. Tenant shall not cause or permit the application of biocides, defoliants, chemical fertilizers, pesticides or other agrichemicals, except that Tenant may use chemical herbicides and pesticides to control noxious weeds and pests only if (i) Tenant demonstrates to City satisfaction that no other method of control is effective, (ii) the herbicide or pesticide and method of application are first approved for use by City, any appropriate governmental authorities or regulatory agencies and a Pesticide Control Advisor, (iii) the herbicide or pesticide is used only in those amounts and with that frequency of application which constitutes the minimum necessary for the control or containment

of such weeds and pests, (iv) the herbicide or pesticide will not get into any water supplies, and (v) such use is in compliance with all applicable Laws.

(m) **Covenant to Keep Premises Free of Noxious Weeds**. Tenant shall not introduce any noxious weeds on or about the Premises. Tenant shall control noxious weeds as required by applicable Law, provided that Tenant may use chemical herbicides only if such use complies with the requirements of subsection (k) above.

(n) **Covenant re Obstructive Vegetation**. Should any vegetation, including, without limitation, downed timber, obstruct Tenant's livestock grazing, Tenant shall not remove such vegetation without first obtaining City prior approval.

(o) **Covenant Regarding Roads**. Tenant shall keep all roads on the Premises open and in the same condition as such roads are in as of the Commencement Date hereof, ordinary wear and tear excepted, and shall not interfere with any travel on such roads. Tenant shall not use or allow the use of nonpublic roads for any nongrazing purposes.

(p) **Covenant Against Burning**. Tenant shall not burn any weeds, debris or other substances on or about the Premises.

(q) **Covenant Against Off-Road Vehicles**. Except as otherwise approved by City in writing, Tenant shall not use or permit the use of off-road vehicles on any portion of the Premises except on existing roads and in the manner for which such roads are intended.

(r) **Pest Control**. Tenant shall at its own cost and expense comply with all federal, state, county and City pest rodent control programs to the satisfaction of City. City reserves the right to determine any and all parameters of pest species control including, without limitation, species , methods, equipment, chemicals, application rate, timetable, follow-up and areas needing control.

(s) **Monuments**. Tenant acknowledges that the monuments shown on Exhibit C attached hereto are in place and in good condition. During the installation of any Improvement hereunder and at all times during the Lease Term, Tenant shall protect and safeguard City's monuments. Tenant agrees to reimburse City in the amount of $750.00 for each monument necessitating resurvey, repair and/or replacement. During the Lease Term, the City may replace missing monuments, or install new monuments. When missing monuments are replaced or new monuments installed, Tenant will be given written notice and thereafter Tenant shall assume the same protection and reimbursement responsibilities as with existing monuments provided herein.

(t) **Heavy Equipment and Vehicles**. To prevent damage to City's underground pipelines existing now or installed in the future, Tenant's use of vehicles and equipment, within twenty feet (20') of City's pipelines shall be subject to the following restrictions:

(i) The depth of soil cover over the tops of City's pipelines must be at least three feet (3') for steel cylinder pipe and four feet (4') for pre-stressed concrete cylinder pipe to

accommodate the loading as defined below in item (ii). If any equipment with axle loading exceeds the weight stated in item (ii) below, Tenant shall submit to City for review and approval, engineering calculations prepared by a registered civil engineer to provide adequate protection of the pipelines showing that City's pipelines will not be adversely damaged.

(ii) The "axle loading" of vehicles and equipment must not exceed that allowed for "AASHO Standard H-10 Loading." H-10 loading is defined as loading caused by a two-axle truck with a gross weight of ten tons (20,000 lbs.) axles 14 feet (14') apart and rear axle carrying eight tons (16,000 lbs.). Tenant shall be responsible to provide City adequate evidence that its equipment and vehicles meet the foregoing requirements.

(iii) Tenant shall not use vibrating compaction equipment unless it first obtains City's written approval.

(iv) If potholing establishes that the depth of the soil cover over the pipeline is less than the minimum stated in (i) above, all excavating and grading over the pipeline shall be performed manually. For any machinery equipment excavation and grading over and within twenty feet (20') each side of the pipeline, Tenant shall submit a written proposal together with all supporting calculations and data to City for review and approval.

(u) **Trees and Other Plantings**. Tenant shall not plant any trees or other vegetation except as expressly approved by City.

(v) **No Fuel Storage**. Tenant shall not maintain or store any type of gasoline, propane, oil or other fuel in, on or near the Premises.

9. IMPROVEMENTS

9.1 **Construction of Improvements**. Except as expressly provided in this Lease, Tenant shall not construct or install any Improvements nor make or permit any Alterations in, to or about the Premises, without City's prior written consent in each instance, which City may give or withhold in its sole and absolute discretion. Subject to City's consent as provided above, any permitted Improvements or Alterations shall be done at Tenant's sole expense (i) in strict accordance with plans and specifications approved in advance by City in writing, (ii) in a good and professional manner, (iii) in strict compliance with all Laws, and (iv) subject to all other conditions that City may reasonably impose, including, without limitation, provision of such completion security as is acceptable to City. In no event shall the construction or installation of any such Improvements or the making of any Alterations impair the use or operation of the City Facilities, or any portion thereof, or City's access thereto. Prior to the commencement of any work on the Premises to construct any permitted Improvements or make any permitted Alterations, Tenant, at its sole cost and expense, shall procure all required permits and approvals and shall promptly upon receipt deliver copies of all such documents to City. No material change from the plans and specifications approved by City may be made without City's prior consent. City and its Agents shall have the right to inspect the course of such construction at all times. Upon completion of such Improvements or Alterations, Tenant shall furnish City with a complete set of final as-built plans

and specifications, if applicable. If the cost of any proposed Improvements or Alterations is in excess of Five Thousand Dollars ($5,000), Tenant shall pay City an administrative fee equal to ten percent (10%) of the total cost of the work.

9.2 **Ownership of Improvements**. Any Improvements or Alterations constructed on or affixed to the Premises by or on behalf of Tenant pursuant to the terms and limitations of Section 9.1 above shall be and remain City's property. Upon the Expiration Date or any earlier termination hereof, Tenant shall surrender all such Improvements and Alterations without any further action by either party, without any obligation by City to pay any compensation therefor to Tenant and without the necessity of any deed from Tenant to City. However, in the event that City, at its sole option and without limiting any of the provisions of Section 9.1 above, requires as a condition to approval of any such Improvements or Alterations that Tenant remove such Alterations or Improvements from the Premises upon the expiration or termination of this Lease, Tenant shall do so in accordance with the provisions of Section 22.1 hereof.

9.3 **Tenant's Personal Property**. All mineral block containers, creep feeders, feeding panels, hay feeders, grain feeders, fence panels, bow gate panels, squeeze chute, crowding alley, landing chute, palpation cage, articles of movable personal property and other equipment installed in the Premises by or for the account of Tenant that can be removed without structural or other material damage to the Premises (all of which are herein called "**Tenant's Personal Property**") shall be and remain the property of Tenant and may be removed by it subject to the provisions of Section 22.1 hereof. At least ten (10) days prior to delinquency, Tenant shall pay all taxes levied or assessed upon Tenant's Personal Property and shall deliver satisfactory evidence of such payment to City.

10. GRAZING METHOD

10.1 **Annual Grazing Plan**. Tenant shall manage and use the Premises throughout the Term in a good and proper manner, according to approved methods of range management and grazing practices as established and modified from time to time by City. Prior to the Commencement Date, Tenant shall deliver to City an annual Grazing Plan satisfactory to City. The Grazing Plan shall set forth both the proposed method of operation on the Premises and any additional responsibilities for Long-Term Maintenance, Herd Health, Pest Control, and/or development of range resources that are warranted by conditions or circumstances deemed significant by the City. The Grazing Plan shall also set forth the number of animal unit months to be stocked on each grazing unit based on current forage conditions, and include a RDM target level for May 15 annually for the AUM specified. Once approved by City, the Grazing Plan shall be implemented and maintained by Tenant during the Lease Year. Each Lease Year thereafter, Tenant shall prepare a new Grazing Plan to be delivered to City by October 1. Within ten (10) working days of receiving the Grazing Plan, City shall notify Tenant in writing whether it is acceptable. If unacceptable, City shall state in its notice all changes that need to be made to the Grazing Plan. Tenant shall incorporate all changes into the Grazing Plan and resubmit the Grazing Plan for City's approval.

10.2 **Distribution of Livestock**. Tenant shall obtain optimum distribution of livestock over the Premises by distributing or rotating livestock among the pastures to obtain uniform range utilization, minimize overgrazed areas and reduce the overall fire hazard. Accordingly, all cross-fences that define any pasture shall be maintained by Tenant to the satisfaction of the City and in such a way that livestock can be effectively confined within said pasture by merely closing and latching all gates. Tenant shall distribute all salt blocks uniformly throughout the Premises; provided, however, no salt block shall be located within 1,000 feet of a permanent livestock watering area. Tenant shall periodically move salt blocks and any other feed supplements at the direction of City.

10.3 **Grazing Within Premises**. Tenant shall prevent livestock from roaming or grazing upon any adjacent lands of City or of third parties. In the event City learns that Tenant's livestock has roamed beyond the Premises boundaries, City may notify Tenant orally or in writing of the general location and number of livestock in violation. If Tenant fails to retrieve the livestock within twenty-four (24) hours of notification by City or any other person, City may, at its option, immediately take any steps required to remove or impound the roaming livestock and charge the costs thereof, including labor, materials and equipment, to Tenant. All such costs shall be due and payable by Tenant upon demand by City. If City determines that the roaming livestock poses an immediate threat to any person or property, City shall have the right, but not the obligation, to take any steps required to remove or impound the roaming livestock without prior notification to Tenant. All costs incurred by City shall be reimbursed by Tenant and due and payable upon demand by City.

10.4 **Exclusion of Livestock From Reservoirs and Riparian Zones**. Tenant shall prevent livestock from roaming upon Reservoir Buffers or the reservoir side of exclusion fences surrounding any drinking supply reservoir or where fencing is absent, within the areas occupied by water when said reservoir is at spill elevation (high water mark), regardless of the time of year, or within any Stream Zone Buffer or fenced riparian zone. Tenant shall prevent calves from roaming upon Fenced Riparian Pastures. In the event the City observes: (1) livestock roaming upon Reservoir Buffers or the reservoir side of the exclusion fences or below the high water mark, or within Stream Zone Buffers or any fences riparian zone, or (2) calves within Fenced Riparian Pastures, City will personally notify Tenant of the general location and number of livestock or calves in violation. If Tenant fails to remove immediately roaming livestock, City may, at its option, take any steps required to remove and/or impound the roaming livestock and charge the costs thereof, including labor, materials and equipment, to Tenant, which costs shall be due and payable by Tenant upon written demand by City.

10.5 **Restrictions on Horses**. Tenant shall not pasture or permit the pasturage of horses on the Premises unless Tenant physically resides on the Premises under a separate occupancy agreement with City. In such instance, Tenant may pasture only such horses as are needed for the day-to-day operation of the Premises for cattle grazing by the Tenant and such ranch hands as may be residing with or necessary to Tenant. Tenant and each ranch hand may pasture on the Premises a maximum of two (2) horses each not to exceed a total of six (6) horses at a given time without the prior written authorization of City. Should Tenant exceed the authorized number of horses, Tenant

shall, within ten (10) days of receipt of notice from City to do so, remove the number of horses necessary to comply with the maximum number of horses permitted.

11. MAINTENANCE

11.1 **Routine Maintenance**. Tenant assumes full and sole responsibility for the condition, operation, repair and maintenance and management of the Premises and any permitted Improvements from and after the Commencement Date. City shall not under any circumstances be responsible for the performance of any repairs, changes or alterations to the Premises or any other part of the Improvements or City Facilities, nor shall City be liable for any portion of the cost thereof. Tenant shall make all repairs and replacements, ordinary as well as extraordinary, foreseen and unforeseen, that may be necessary to maintain the Premises and any permitted Improvements at all times in clean, safe, attractive and sanitary condition and in good order and repair, to City's reasonable satisfaction. If any portion of the Premises or any of City's property located on or about the Premises is damaged by any of the activities conducted by Tenant or its Agents or Invitees hereunder, Tenant shall immediately, at is sole cost and expense, repair any and all such damage and restore the Premises or City's property to its previous condition.

11.2 **Utilities**. City has no responsibility or liability of any kind with respect to any utilities that may be on or about the Premises. Tenant has the sole responsibility to locate such utilities and protect them from damage. Tenant shall make all arrangements directly with the utility companies for, and shall pay for, any and all utilities and services furnished to or used by it, including, without limitation, gas, electricity, water, sewage, and telephone service for all deposits, connection and installation charges. Tenant shall be responsible for installation and maintenance of all facilities required in connection with such utility services. The Parties agree that any and all utility improvements shall be subject to the provisions of Section 9.1 and that such improvements shall be deemed part of City's real property, and not personal property or trade fixtures of Tenant. During the Term, Tenant shall be obligated to repair and maintain any and all utility systems and improvements located on or within the Premises in good operating condition. City shall not be liable for any failure or interruption of any utility service furnished to the Premises, and no such failure or interruption shall entitle Tenant to any abatement in Base Rent or to terminate this Lease.

11.3 **No Right to Repair and Deduct**. Tenant expressly waives the benefit of any existing or future Law or judicial or administrative decision that would otherwise permit Tenant to make repairs or replacements at City's expense, or to terminate this Lease because of City's failure to keep the Premises or the Improvements or any part thereof in good order, condition or repair, or to abate or reduce any of Tenant's obligations hereunder on account of the Premises or the Improvements or any part thereof being in need of repair or replacement. Without limiting the foregoing, Tenant expressly waives the provisions of California Civil Code Sections 1932, 1941 and 1942 or any similar Laws with respect to any right of Tenant to terminate this Lease and with respect to any obligations of City for tenantability of the Premises and any right of Tenant to make repairs or replacements and deduct the cost thereof from Base Rent.

11.4 **Long-Term Maintenance**.

(a) **Procedure**. In addition to its routine maintenance responsibilities, Tenant shall perform such items of Long Term Maintenance (as hereinafter defined) as may from time-to-time be approved in advance or directed by City as specified by the current Grazing Plan. For any long term maintenance project with an estimated cost in excess of $5000.00, Tenant shall obtain three (3) bids from qualified contractors and forward them to City. In the event Tenant elects to do the work itself, no bids are necessary provided Tenant's bid price is less than the City's fair cost estimate. Bids will be selected on the basis of completion of the project at a reasonable price and in a sound, efficient, timely manner. Tenant shall notify City at least three (3) days prior to commencing the work and immediately upon completion thereof. In any agreement entered into between Tenant and any outside contractor(s) to perform work as required under this Lease pursuant to this Section 11.4 the following language shall be incorporated into said contract:

> Contractor represents that it is fully experienced and properly qualified to provide the services required by this contract. Contractor shall act as an independent professional and not as an agent of City. It shall maintain complete control of its employee(s) and subcontractor(s) and nothing contained in this agreement or any subcontractor agreement shall create a contractual relationship between contractor or any subcontractor and City. Contractor shall perform all work in a good and professional manner and in compliance with this agreement and applicable laws and regulations, and written supplemental instructions from City.

Any agreements entered into by Tenant with contractors to perform work in accordance with this Lease must receive prior approval by City. City can condition its approval on (i) the contractor maintaining adequate insurance from an insurance and with coverages and terms acceptable to City's Risk Manager and (ii) the contractor Indemnifying the City for matters arising out of the work to be performed by contractor. City shall inspect the work for adherence to specifications and quality of workmanship and will review receipts and bills of sale for adherence to the previously approved bid estimates.

(b) **Actual Costs**. Tenant shall receive credit against the Annual Base Rental for the Premises for the Actual Costs incurred in the performance of said items upon satisfactory completion of such performance. The total amount of the credit shall not exceed fifty percent (50%) of the current annual Base Rent. Tenant shall not accept any federal cost sharing payments for conservation practices required by Tenant that would result in a duplicate payment. The Parties acknowledge that the sum of all credit for "Actual Costs" may include only such costs as are incurred by Tenant and approved in the annual Grazing Plan in advance by City and Tenant for Long-Term Maintenance. Final determination of Actual Costs shall not be completed until Tenant has provided City with all receipts or other appropriate documentation required to account for all such Actual Costs. Once so verified, City will credit said Actual Costs against the next semiannual installment payment.

[illegible]

> [illegible]

[illegible]

[illegible]

12. LIENS

Tenant shall keep the Premises and all other portions of the City Facilities and Improvements free from any liens arising out of any work performed, material furnished, indebtedness or any other obligations whatsoever incurred by or for Tenant. In the event Tenant does not, within five (5) days following the imposition of any such lien, cause the lien to be released of record by payment or posting of a proper bond, City shall have in addition to all other remedies provided herein and by Law or equity the right, but not the obligation, to cause the same to be released by such means as it shall deem proper, including, but not limited to, payment of the claim giving rise to such lien. All such sums paid by City and all expenses it incurs in connection therewith (including, without limitation, reasonable attorneys' fees) shall be payable to City by Tenant upon demand. City shall have the right at all times to post and keep posted on the Premises any notices permitted or required by Law or that City deems proper for its protection and protection of the Premises, Improvements and City Facilities, from mechanics' and materialmen's liens. Tenant shall give City at least fifteen (15) days' prior written notice of the commencement of any repair or construction. Notwithstanding the foregoing, Tenant shall have the right, upon posting of an adequate bond or other security acceptable to City, to contest any such lien, and in such case City shall not seek to satisfy or discharge such lien unless Tenant has failed to do so within ten (10) days after final determination of the validity thereof. Tenant shall Indemnify City, the other Indemnified Parties and the Premises, Improvements and the City Facilities against any and all Losses arising out of any such contest.

13. COMPLIANCE WITH LAWS

13.1 **Compliance with Laws**. Tenant shall, at its sole cost and expense, maintain the Premises, any Improvements permitted hereunder and Tenant's use and operations thereon in strict compliance at all times with all present or future Laws, whether foreseen or unforeseen, ordinary as well as extraordinary, including, without limitation, all Laws relating to health and safety and handicap accessibility (including the Americans with Disabilities Act).

13.2 **Regulatory Approvals**.

(a) **Responsibility for Obtaining Approvals**. Tenant understands and agrees that Tenant's use of the Premises and construction of the Improvements permitted hereunder may require authorizations, approvals or permits from governmental regulatory agencies with jurisdiction over the Premises. Tenant shall be solely responsible for obtaining any and all such regulatory approvals. Tenant shall not seek any regulatory approval without first obtaining the written consent of the City. Tenant shall bear all costs associated with applying for and obtaining with any necessary or appropriate regulatory approval and shall be solely responsible for satisfying any and all conditions imposed by regulatory agencies as part of a regulatory approval. Any fines or penalties levied as a result of Tenant's failure to comply with the terms and conditions of any regulatory approval shall be immediately paid and discharged by Tenant, and City shall have no liability, monetary or otherwise, for any such fines or penalties. Tenant shall Indemnify City, the other Indemnified Parties and the Premises, Improvements and City Facilities Property against all

Losses arising in connection with Tenant's failure to obtain or comply with the terms and conditions of any regulatory approval.

(b) **Approvals**. Tenant further understands and agrees that City, acting by and through the PUC, is entering into this Lease in its capacity as a property owner with a proprietary interest in the Premises and not as a regulatory agency with police powers. Nothing in this Lease shall limit in any way Tenant's obligation to obtain any required approvals from any federal, state or local departments, agencies, boards or commissions having jurisdiction over the Premises. By entering into this Lease, City is in no way modifying or limiting Tenant's obligation to cause the Premises or any permitted Improvements to be used and occupied in accordance with all applicable Laws, as provided further above.

13.3 **Compliance with City's Risk Management Requirements**. Tenant shall not do anything, or permit anything to be done, in or about the Premises or any Improvements permitted hereunder that would create any unusual fire risk or subject City to any potential liability. Tenant shall faithfully observe, at its expense, any and all reasonable requirements of City's Risk Manager with respect thereto and with the requirements of any policies of public liability, fire or other policies of insurance at any time in force with respect to the Premises and any Improvements as required hereunder.

13.4 **Reports**. City may request from time to time Tenant to submit a report and provide such documentation regarding Tenant's operations and evidencing compliance thereof with all Laws.

14. DAMAGE OR DESTRUCTION

14.1 **Damage or Destruction to the Improvements**. In the case of damage to or destruction of the Premises by fire or any other casualty, whether insured or uninsured, Tenant shall, at its sole cost and expense and with reasonable promptness and diligence, restore, repair, replace or rebuild the Improvements as nearly as possible to the same condition they were in immediately before such damage or destruction, unless such damage or destruction was caused solely and directly by the active negligence or willful misconduct of City or its Agents.

14.2 **Abatement in Base Rent**. Base Rent payable hereunder during the period from the date of the casualty until completion of the restoration, repairs, replacement or rebuilding shall be abated if such casualty reduces the then current Base Grazing Capacity. If a reduction of the Base Grazing Capacity occurs, the Base Rent shall be reduced pursuant to Section 5.2 hereof.

14.3 **Waiver**. The Parties understand and agree that the foregoing provisions of this Section are intended to govern fully the rights and obligations of the Parties in the event of a Taking, and City and Tenant each hereby waives and releases any right to terminate this Lease in whole or in part under Sections 1932.2 and 1933.4 of the Civil Code of California or under any similar Laws now or hereafter in effect, to the extent such rights are inconsistent with the provisions hereof.

15 EMINENT DOMAIN

15.1 **General**. If during the Term or during the period between the execution of this Lease and the Commencement Date, Taking of all or any part of the Premises or any interest in this Lease occurs, the rights and obligations of the Parties hereunder shall be determined pursuant to this Section. City and Tenant intend that the provisions hereof govern fully in the event of a Taking and accordingly, the Parties each hereby waive any right to terminate this Lease in whole or in part under Sections 1265.120 and 1265.130 of the California Code of Civil Procedure or under any similar Law now or hereafter in effect.

15.2 **Total Taking; Automatic Termination**. If a total Taking of the Premises occurs, this Lease shall terminate as of the Date of Taking.

15.3 **Partial Taking; Election to Terminate**.

(a) **Conditions for Termination**. If a Taking of any portion (but less than all) of the Premises occurs, this Lease shall terminate in its entirety under either of the following circumstances: (i) if all the following exist: (A) the partial Taking renders the remaining portion of the Premises unsuitable for continued use by Tenant, (B) the condition rendering the Premises unsuitable either is not curable or is curable but City is unwilling or unable to cure such condition, and (C) Tenant elects to terminate; or (ii) if City elects to terminate, except that this Lease shall not terminate if Tenant agrees to, and does, pay full Base Rent, without abatement, and otherwise agrees to, and does, fully perform all its obligations hereunder.

(b) **City's Right to Terminate**. In the event of a partial Taking of a substantial portion of the City Facilities, but not the Premises, City shall have the right to terminate this Lease in its entirety.

(c) **Notice of Termination**. Either Party electing to terminate under the provisions of this Article 15 shall do so by giving the other Party written notice to the other Party before or within thirty (30) days after the Date of Taking, and thereafter this Lease shall terminate upon the later of the thirtieth (30th) day after such written notice is given or the Date of Taking.

15.4 **Base Rent; Award**. Upon termination of this Lease pursuant to an election under Section 15.3 above, then: (i) Tenant's obligation to pay Base Rent shall continue up until the date of termination, and thereafter shall cease, except that Base Rent shall be reduced as provided in Section 15.5 below for any period during which this Lease continues in effect after the Date of Taking, and (ii) City shall be entitled to the entire Award in connection therewith (including, but not limited to, any portion of the Award made for the value of the leasehold estate created by this Lease), and Tenant shall have no claim against City for the value of any unexpired term of this Lease, provided that Tenant may make a separate claim for compensation, and Tenant shall receive any Award made specifically to Tenant, for Tenant's relocation expenses or the interruption of or damage to Tenant's business or damage to Tenant's livestock or other personal property.

15.5 **Partial Taking; Continuation of Lease**. In the event of a partial Taking of the Premises under circumstances where this Lease is not terminated in its entirety under Section 15.3 above, this Lease shall terminate as to the portion of the Premises so taken, but shall remain in full force and effect as to the portion not taken, and the rights and obligations of the Parties shall be as follows: (i) Base Rent shall be reduced based on the reduction of Base Grazing Capacity calculated pursuant to Section 5.2 hereof, provided, that in no event shall the monthly Base Rent be reduced to less than seventy-five percent (75%) of the monthly Base Rent immediately prior to the Date of Taking, and (ii) City shall be entitled to the entire Award in connection therewith (including, but not limited to, any portion of the Award made for the value of the leasehold estate created by this Lease). Tenant shall have no claim against City for the value of any unexpired Term of this Lease, provided that Tenant may make a separate claim for compensation. Tenant shall retain any Award made specifically to Tenant for Tenant's relocation expenses or the interruption of or damage to Tenant's business or damage to Tenant's livestock or other Personal Property.

15.6 **Temporary Takings**. Notwithstanding anything to contrary in this Section, if a Taking occurs with respect to all or any part of the Premises for a limited period of time not in excess of one hundred eighty (180) consecutive days, this Lease shall remain unaffected thereby, and Tenant shall continue to pay Base Rent and to perform all the terms, conditions and covenants of this Lease. In the event of such temporary Taking, Tenant shall be entitled to receive that portion of any Award representing compensation for the use of the Premises during the Term up to the total Base Rent owing by Tenant for the period of the Taking, and City shall be entitled to receive the balance of any Award.

16. ASSIGNMENT AND SUBLETTING

16.1 **Restriction on Assignment and Subletting**. Tenant shall not directly or indirectly (including, without limitation, by merger, acquisition or other transfer of any controlling interest in Tenant), voluntarily or by operation of Law, sell, assign, encumber, pledge or otherwise transfer any part of its interest in or rights with respect to the Premises, any Improvements or its leasehold estate hereunder (collectively, "**Assignment**"), or permit any portion of the Premises or any Improvements to be used by anyone other than itself, or sublet any portion of the Premises or any permitted Improvements thereon (collectively, "**Sublease**"), without City's prior written consent in each instance, which City may give or withhold in its sole and absolute discretion.

16.2 **Effect of Transfer**. No Sublease or Assignment by Tenant nor any consent by City thereto shall relieve Tenant, or any guarantor, of any obligation to be performed by Tenant under this Lease. Any Sublease or Assignment that is not in compliance with this Article shall be void and, at City's option, shall constitute a material Event of Default by Tenant under this Lease. The acceptance of any Base Rent or other payments by City from a proposed Transferee shall not constitute consent to such Sublease or Assignment by City or a recognition of any Transferee, or a waiver by City of any failure of Tenant or other transferor to comply with this Article.

16.3 **Assumption by Transferee**. Each Transferee shall assume all obligations of Tenant under this Lease and shall be and remain liable jointly and severally with Tenant for the payment of Base Rent, and for the performance of all of the terms, covenants and conditions to be

performed by Tenant under this Lease. No Assignment shall be binding on City unless Tenant or Transferee shall deliver to City a counterpart of the Assignment and an instrument in recordable form that contains a covenant of assumption by such Transferee satisfactory in substance and form to City, and consistent with the requirements of this Article. However, the failure or refusal of such Transferee to execute such instrument of assumption shall not release such Transferee from its liability as set forth above. Tenant shall reimburse City on demand for any reasonable costs that may be incurred by City in connection with any proposed Transfer, including, without limitation, the costs of making investigations as to the acceptability of the proposed Transferee and legal costs incurred in connection with the granting of any requested consent.

17. DEFAULT; REMEDIES

17.1 **Events of Default**. Any of the following shall constitute an event of default ("**Event of Default**") by Tenant hereunder:

(a) **Base Rent**. Any failure to pay any Base Rent or other sums as and when due, provided Tenant shall have a period of three (3) days from the date of written notice from City within which to cure any default in the payment of Base Rent or other sums; provided, however, that City shall not be required to provide such notice regarding Tenant's failure to make such payments when due more than once during any calendar year, and any such failure by Tenant after Tenant has received one (1) such notice in any calendar year from City shall constitute a default by Tenant hereunder without any requirement on the part of City to give Tenant notice of such failure or an opportunity to cure except as may be required by Section 1161 of the California Code of Civil Procedure;

(b) **Covenants, Conditions and Representations**. Any failure to perform or comply with any other covenant, condition or representation made under this Lease, provided Tenant shall have a period of fifteen (15) days from the date of written notice from City within which to cure such default under this Lease, or, if such default is not capable of cure within such 15-day period, Tenant shall have a reasonable period to complete such cure if Tenant promptly undertakes action to cure such default within such 15-day period and thereafter diligently prosecutes the same to completion and Tenant uses its best efforts to complete such cure within sixty (60) days after the receipt of notice of default from City; provided, however, that upon the occurrence during the Term of two (2) defaults of the same obligation City shall not be required to provide such notice regarding Tenant's failure to perform such obligation, and any such failure by Tenant after Tenant has received two (2) such notices shall constitute a default by Tenant hereunder without any requirement on the part of City to give Tenant notice of such failure or an opportunity to cure;

(c) **Vacation; Abandonment**. Any vacation or abandonment of the Premises for more than fourteen (14) consecutive days; and

(d) **Bankruptcy**. The appointment of a receiver to take possession of all or substantially all the assets of Tenant, or an assignment by Tenant for the benefit of creditors, or any action taken or suffered by Tenant under any insolvency, bankruptcy, reorganization, moratorium

or other debtor relief act or statute, whether now existing or hereafter amended or enacted, if any such receiver, assignment or action is not released, discharged, dismissed or vacated within sixty (60) days.

17.2 **Remedies**. Upon the occurrence of an Event of Default by Tenant, City shall have the following rights and remedies in addition to all other rights and remedies available to City at Law or in equity:

(a) **Termination**. The rights and remedies provided by California Civil Code Section 1951.2 (damages on termination for breach), including, but not limited to, the right to terminate Tenant's right to possession of the Premises and to recover the worth at the time of award of the amount by which the unpaid Base Rent and Additional Charges for the balance of the Term after the time of award exceeds the amount of rental loss for the same period that Tenant proves could be reasonably avoided, as computed pursuant to subsection (b) of such Section 1951.2. City's efforts to mitigate the damages caused by Tenant's breach of this Lease shall not waive City's rights to recover damages upon termination.

(b) **Relet**. The rights and remedies provided by California Civil Code Section 1951.4 (continuation of lease after breach and abandonment), which allows City to continue this Lease in effect and to enforce all its rights and remedies under this Lease, including the right to recover Base Rent as it becomes due, for so long as City does not terminate Tenant's right to possession, if Tenant has the right to sublet or assign, subject only to reasonable limitations. For purposes hereof, none of the following shall constitute a termination of Tenant's right of possession: acts of maintenance or preservation; efforts to relet the Premises or the appointment of a receiver upon City's initiative to protect its interest under this Lease; or withholding consent to an Assignment or Sublease, or terminating an Assignment or Sublease, if the withholding or termination does not violate the rights of Tenant specified in subdivision (b) of California Civil Code Section 1951.4. If City exercises its remedy under California Civil Code Section 1951.4, City may from time to time sublet the Premises or any part thereof for such term or terms (which may extend beyond the Term) and at such rent and upon such other terms as City in its sole discretion may deem advisable, with the right to make alterations and repairs to the Premises. Upon each such subletting, Tenant shall be immediately liable for payment to City of, in addition to Base Rent and Additional Charges due hereunder, the cost of such subletting and such alterations and repairs incurred by City and the amount, if any, by which the Base Rent and Additional Charges owing hereunder for the period of such subletting (to the extent such period does not exceed the Term) exceeds the amount to be paid as Base Rent and Additional Charges for the Premises for such period pursuant to such subletting. No action taken by City pursuant to this subsection shall be deemed a waiver of any default by Tenant and, notwithstanding any such subletting without termination, City may at any time thereafter elect to terminate this Lease for such previous default.

(c) **Receiver**. The right to have a receiver appointed for Tenant upon application by City to take possession of the Premises and to apply any rental collected from the Premises and to exercise all other rights and remedies granted to City pursuant to this Lease.

(d) **Lien**. The rights and remedies provided by California Civil Code Sections 3080 et seq. (foreclosure of livestock lien), which includes that right to retain possession of the livestock, charge the Tenant for the reasonable value of providing livestock services to the livestock until the Tenant's obligations secured by the lien have been satisfied and selling the livestock.

17.3 **City's Right to Cure Tenant's Defaults**. If Tenant defaults in the performance of any of its obligations under this Lease, City may at any time thereafter with three (3) days prior oral or written notice (except in the event of an emergency as determined by City), remedy such Event of Default for Tenant's account and at Tenant's expense. Tenant shall pay to City as additional Base Rent, promptly upon demand, all sums expended by City, or other costs, damages, expenses or liabilities incurred by City, including, without limitation, reasonable attorneys' fees, in remedying or attempting to remedy such Event of Default. Tenant's obligations under this Section shall survive the termination of this Lease. Nothing herein shall imply any duty of City to do any act that Tenant is obligated to perform under any provision of this Lease, and City's cure or attempted cure of Tenant's Event of Default shall not constitute a waiver of Tenant's Event of Default or any rights or remedies of City on account of such Event of Default.

18. INDEMNIFICATION

18.1 **Limitation on City's Liability**. Tenant covenants and agrees that City shall not be responsible for or liable to Tenant for, and, to the fullest extent allowed by Law, Tenant hereby waives all rights against City and its Agents and releases City and its Agents from, any and all Losses relating to any injury, accident or death of any person or loss or damage to any property, in or about the Premises, Improvements or City Facilities, from any cause whatsoever, other than as a direct and proximate result of the gross negligence or willful misconduct or omission of City or its Agents.

18.2 **Tenant's Indemnity**. Tenant, on behalf of itself and its successors and assigns, shall Indemnify City, PUC, their Agents and their respective heirs, legal representatives, successors and assigns (individually and collectively, the "**Indemnified Parties**"), and each of them, from and against any and all Losses incurred in connection with or arising directly or indirectly, in whole or in part, out of: (a) any accident, injury to or death of a person, including, without limitation, employees of Tenant, or loss of or damage to property (including, without limitation, the City Facilities) howsoever or by whomsoever caused, occurring in, on or about the Premises, City Facilities or the Improvements; (b) any default by Tenant in the observation or performance of any of the terms, covenants or conditions of this Lease to be observed or performed on Tenant's part; (c) the use, occupancy, conduct or management, or manner of use, occupancy, conduct or management by Tenant, its Agents or Invitees or any person or entity claiming through or under any of them, of the Premises or any Improvements; (d) the condition of the Premises or any Improvements; (e) any construction or other work undertaken by Tenant on or about the Premises or any Improvements whether before or during the Term of this Lease; or (f) any acts, omissions or negligence of Tenant, its Agents or Invitees, or of any trespassers, in, on or about the Premises or any Improvements; all regardless of the active or passive negligence of, and regardless of whether liability without fault is imposed or sought to be imposed on, the Indemnified Parties, except to the extent that such Indemnity is void or otherwise unenforceable under applicable Law in effect on or validly

retroactive to the date of this Lease and further except only such Losses as are caused exclusively by the gross negligence and willful misconduct or omission of the Indemnified Parties. The foregoing Indemnity shall include, without limitation, reasonable fees of attorneys, consultants and experts and related costs and City's costs of investigating any Loss. In addition to Tenant's obligation to indemnify City, Tenant specifically acknowledges and agrees that it has an immediate and independent obligation to defend the City from any claim which actually or potentially falls within this indemnity provision even if such allegation is groundless, fraudulent or false, which obligation arises at the time such claim is tendered to Tenant by City and continues at all times thereafter. Tenant's obligations under this Section shall survive the expiration or sooner termination of the Lease.

19. INSURANCE

19.1 Tenant's Insurance.

(a) **Property Insurance**. At all times Tenant shall, at its sole cost and expense, keep the Premises including any permitted Improvements insured for the mutual benefit of City and Tenant against:

(i) Loss or damage by such perils as are included in the standard "All Risks Form" of property damage insurance, in amounts sufficient to prevent City or Tenant from becoming a co-insurer within the terms of the applicable policies, and, in any event, in an amount equal to 100% of the full insurable value of the Improvements as established by City.

(ii) Such other risks in such amounts as City's Risk Manager may reasonably require.

(iii) Comprehensive or commercial general liability insurance with limits not less than One Million Dollars ($1,000,000) each occurrence combined single limit for bodily injury and property damage, including contractual liability, independent contractors, broad-form property damage, fire damage legal liability (of not less than Two Hundred Fifty Thousand Dollars ($250,000)), personal injury, products and completed operations.

(b) **Public Liability and Other Insurance**. Tenant shall at all times, at its cost, maintain insurance for the mutual benefit of City and Tenant against:

(i) Claims for personal injury, including, without limitation, bodily injury or property damage, occurring in or upon the Premises, Improvements or the City Facilities or the roads adjoining the Premises, under a policy of general public liability insurance, with such limits as may reasonably be required by City from time to time, but in any event not less than One Million Dollars ($1,000,000) combined single limit.

(ii) Loss of rental from the Premises, Improvements or the City Facilities, under a rental value insurance policy covering risk of loss due to the occurrence of any of the risks described in connection with the Property Insurance, naming City as primary insured, in

an amount sufficient to prevent City and Tenant from becoming co-insurers, and in any event, in an amount not less than the aggregate requirements for Base Rent for a period of twelve (12) months following the occurrence of the insured casualty and for such additional time as is required by Tenant to complete the reconstruction and restoration of the Premises, Improvements or the City Facilities following the occurrence of such casualty.

(iii) Worker's compensation insurance with employer's liability insurance covering all persons employed and with respect to whom death or bodily injury claims could be asserted against City, Tenant or the Premises, Improvements or the City Facilities, not less than $1,000,000 each accident.

(iv) Comprehensive automobile liability insurance with limits not less than $1,000,000 each occurrence combined single limit for bodily injury and property damage, including owned and non-owned and hired vehicles, if Tenant uses automobiles in connection with its use of the Premises or Improvements.

19.2 **General Requirements**. All insurance provided for under this Lease shall be effected under valid enforceable policies issued by insurers of recognized responsibility and reasonably acceptable to City.

(a) **Claims-Made Form**. Should any of the required insurance be provided under a claims-made form, Tenant shall maintain such coverage continuously throughout the term hereof and, without lapse, for a period of three (3) years beyond the expiration or termination of this Lease, to the effect that, should occurrences during the Term give rise to claims made after expiration or termination of this Lease, such claims shall be covered by such claims-made policies.

(b) **Limit Requirement**. Should any of the required insurance be provided under a form of coverage that includes a general annual aggregate limit or provides that claims investigation or legal defense costs be included in such general annual aggregate limit, such general aggregate limit shall double the occurrence or claims limits specified above.

(c) **Other Requirements**. All liability insurance policies shall be endorsed to provide the following:

(i) Name Tenant as the insured and City, its officers, agents and employees, as additional insured, as their respective interests may appear hereunder.

(ii) That such policies are primary insurance to any other insurance available to the additional insureds, with respect to any claims arising out of this Lease, and that insurance applies separately to each insured against whom claim is made or suit is brought. Such policies shall also provide for severability of interests and that an act or omission of one of the named insureds which would void or otherwise reduce coverage shall not reduce or void the coverage as to any insured, and shall afford coverage for all claims based on acts, omissions, injury or damage which occurred or arose (or the onset of which occurred or arose) in whole or in part during the policy period.

(iii) All policies shall be endorsed to provide thirty (30) days' advance written notice to City of cancellation, non-renewal or reduction in coverage, mailed to the address(es) for City set forth in the Basic Lease Information.

19.3 **Proof of Insurance**. Tenant shall deliver to City certificates of insurance in form and with insurers satisfactory to City, evidencing the coverages required hereunder, on or before the Commencement Date, together with complete copies of the policies promptly upon City's request, and Tenant shall provide City with certificates or policies thereafter at least thirty (30) days before the expiration dates of expiring policies. In the event Tenant shall fail to procure such insurance, or to deliver such policies or certificates, City may, at its option, procure the same for the account of Tenant, and the cost thereof shall be paid to City within five (5) days after delivery to Tenant of bills therefor.

(a) **Future Review of Insurance Requirements**. Tenant and City shall periodically review the limits and types of insurance carried pursuant to this Section. If the general commercial practice in City is to carry liability insurance in an amount or coverage materially greater than the amount or coverage then being carried by Tenant with respect to risks comparable to those associated with the Premises, then the amounts or coverages carried by Tenant shall be increased to conform to such general commercial practice.

(b) **Indemnity**. Tenant's compliance with the provisions of this Section shall in no way relieve or decrease Tenant's liability under Section 18.2 above, or any other provision of this Lease.

(c) **Lapses**. Notwithstanding anything to the contrary in this Lease, this Lease shall terminate at the option of City, without notice to Tenant, upon the lapse of any required insurance coverage.

19.4 **Tenant's Personal Property**. Tenant shall be responsible, at its expense, for separately insuring Tenant's Personal Property.

19.5 **City's Self Insurance**. Tenant acknowledges that City self-insures against casualty, property damage and public liability risks and agrees City shall not be required to carry any third party insurance with respect to the Premises or otherwise.

19.6 **Waiver of Subrogation**. Notwithstanding anything to the contrary contained herein, to the extent permitted by their respective policies of insurance, City and Tenant each hereby waive any right of recovery against the other party and against any other party maintaining a policy of insurance covering the Premises, Improvements, City Facilities or the contents, or any portion thereof, for any loss or damage covered by the insurance maintained by such other party with respect to the Premises, the Improvements, City Facilities, or any portion thereof or the contents of the same or any operation therein, whether or not such loss is caused by the fault or negligence of such other party. If any policy of insurance relating to the Premises, Improvements or City Facilities carried by Tenant does not permit the foregoing waiver or if the coverage under

any such policy would be invalidated due to such waiver, Tenant shall obtain, if possible, from the insurer under such policy a waiver of all rights of subrogation the insurer might have against City or any other party maintaining a policy of insurance covering the same loss, in connection with any claim, loss or damage covered by such policy.

20. ACCESS BY CITY

20.1 General Access by City.

(a) **Procedure**. City reserves for itself and its designated Agents, the right to enter the Premises, the Improvements or City Facilities at all reasonable times for any purpose.

(b) **Emergency**. In the event of any emergency, as determined by City, City may, at its sole option and without notice, enter the Premises at any time and alter or remove any Improvements or Tenant's Personal Property. City shall have the right to use any and all means City considers appropriate to gain access to any portion of the Premises, Improvements or City Facilities in an emergency. In such case, City shall not be responsible for any damage or injury to any such property, nor for the replacement of any such property and any such emergency entry shall not be deemed to be a forcible or unlawful entry onto or a detainer of, the Premises, or an eviction, actual or constructive, of Tenant from the Premises or any portion thereof.

(c) **No Liability**. City shall not be liable in any manner for any inconvenience, disturbance, loss of business, nuisance or other damage arising exclusively out of City's entry onto the Premises, Improvements or City Facilities, except damage arising out of the gross negligence or willful misconduct of City or its Agents and not contributed to by the acts or negligence of Tenant or its Agents.

(d) **No Abatement**. Tenant shall not be entitled to any abatement in Base Rent if City exercises any rights reserved in this Section.

(e) **Conduct of Activities**. City shall use its reasonable good faith efforts to conduct any activities on the Premises, Improvements and City Facilities allowed under this Section in a manner that, to the extent practicable, will minimize any disruption to Tenant's use hereunder.

20.2 **Pipeline and Utility Installations**. Without limiting Section 20.1 above, City shall have the right at all times, to enter upon the Premises to use, install, construct, repair, maintain, operate, replace, inspect, and remove City Facilities or any other public utility facilities. City shall bear the expense of any such activities, unless the need is occasioned by the acts, omissions or negligence of Tenant, its Agents or Invitees. City shall not be responsible for any temporary loss or disruption of Tenant's use of the Premises occasioned by any such facility installations or other activities; provided, however, the Base Rent shall be abated to the extent of any material interference with Tenant's use during the period of such interference. Such abatement to be calculated pursuant to Section 5.2 hereof.

20.3 **Roadways**. City and its Agents shall have the right to enter upon and pass through and across the Premises on any existing or future roadways and as City otherwise determines necessary or appropriate for purposes of the City Facilities, provided that City shall use its reasonable good faith efforts to use such roadways in a manner that, to the extent practicable, will minimize any disruption to Tenant's use hereunder.

21. ESTOPPEL CERTIFICATES

21.1 **Form of Certificate; Delivery**. Either Party hereto shall, from time to time during the Term upon not less than twenty (20) days' prior written notice from the other Party, execute, acknowledge and deliver to the other Party, or such persons or entities designated by such other Party, a statement in writing certifying: (a) the Commencement Date and Expiration Date of this Lease, (b) that this Lease is unmodified and in full force and effect (or, if there have been modifications, that the Lease is in full force and effect as modified and stating the modifications), (c) that there are no defaults under this Lease (or if so, specifying the same), (d) the dates, if any, to which the Base Rent has been paid, and (e) any other information that may be reasonably required by any such persons or entities. Any such certificate delivered pursuant to the provisions hereof may be relied upon by the other Party or any prospective purchaser or Encumbrancer of its estate.

22. SURRENDER

22.1 **Removal of Cattle and Surrender of the Premises**. Upon the Expiration Date or any earlier termination of this Lease pursuant hereto, Tenant shall surrender to City the Premises, in good condition, order and repair, free from debris and hazards, and free and clear of all liens, easements and other encumbrances created or suffered by, through or under Tenant. On or before the Expiration Date or any earlier termination hereof, Tenant shall, at its sole cost and expense, remove any and all the livestock and Tenant's Personal Property from the Premises and demolish and remove any and all Improvements and Alterations from the Premises (except for any Improvements or Alterations that City agrees are to remain part of the Premises pursuant to the provisions of Section 9.2 above). In addition, Tenant shall, at its sole cost and expense, repair any damage to the Premises resulting from the removal of any such items and restore the Premises to their condition immediately prior to the presence of any Improvements or Alterations. In connection therewith, Tenant shall obtain any and all necessary permits and approvals, including, without limitation, any environmental permits, and execute any manifests or other documents necessary to complete the demolition, removal or restoration work required hereunder. Tenant's obligations under this Section shall survive the Expiration Date or other termination of this Lease. Any items of Tenant's Personal Property remaining on or about the Premises after the Expiration Date of this Lease may, at City's option, be deemed abandoned and in such case City may dispose of such property in accordance with Section 1980 et seq. of the California Civil Code or in any other manner allowed by Law.

If Tenant fails to surrender the Premises to City on the Expiration Date or earlier termination of the Term as required by this Section, Tenant shall Indemnify City against all Losses resulting therefrom, including, without limitation, Losses made by a succeeding tenant resulting from Tenant's failure to surrender the Premises.

22.2 **Transfer of Title to Premises**. Upon the Expiration Date or earlier termination of this Lease, the Premises shall automatically, and without further act or conveyance on the part of Tenant or City, become the property of City, free and clear of all liens and Encumbrances and without payment therefor by City and shall be surrendered to City upon such date. Upon or at any time after the date of termination of this Lease, if requested by City, Tenant shall promptly deliver to City, without charge, a quitclaim deed to the Premises suitable for recordation and any other instrument reasonably requested by City to evidence or otherwise effect the termination of Tenant's leasehold estate hereunder and to effect such transfer or vesting of title to the Premises or any permitted Improvements or Alterations that City agrees are to remain part of the Premises pursuant to the provisions of Section 9.2 above.

23. HAZARDOUS MATERIALS

23.1 **No Hazardous Materials**. Tenant covenants and agrees that neither Tenant nor any of its Agents or Invitees shall cause or permit any Hazardous Material to be brought upon, kept, used, stored, generated or disposed of in, on or about the Premises or any other part of the Property, or transported to or from the Premises or any other part of the Property without the prior written consent of City, which consent may be withheld in City's sole discretion. Without limiting the foregoing restrictions, Tenant shall handle all Hazardous Materials on the Premises in compliance with all Environmental Laws. Tenant shall immediately notify City if and when Tenant learns or has reason to believe there has been any Release of Hazardous Material in, on or about the Premises or any other part of thereof. City may from time to time request Tenant to provide adequate information for City to determine that any Hazardous Material permitted hereunder is being handled in compliance with all applicable Environmental Laws, and Tenant shall promptly provide all such information. Without limiting Section 23 hereof, City and its Agents shall have the right to inspect the Premises for Hazardous Material and compliance with the provisions hereof at all reasonable times upon reasonable advance oral or written notice to Tenant (except in the event of an emergency).

23.2 **Tenant's Environmental Indemnity**. If Tenant breaches any of its obligations contained in Section 23.1 above, or, if any act or omission of Tenant or any of its Agents or Invitees results in any Release of Hazardous Material in, on, under or about the Premises or any other part thereof, then, without limiting Tenant's general Indemnity contained in Section 18.2 above, Tenant, on behalf of itself and its successors and assigns, shall Indemnify the Indemnified Parties, and each of them, from and against all Hazardous Materials Claims arising during or after the Term of this Lease and relating to such Release. The foregoing Indemnity includes, without limitation, all costs associated with the Investigation and Remediation of Hazardous Material and with the restoration of the Premises or any part thereof to its prior condition including, without limitation, fines and penalties imposed by regulatory agencies, natural resource damages and losses, and revegetation of the Premises. Without limiting the foregoing, if Tenant any of Tenant's Agents or Invitees, causes or permits the Release of any Hazardous Materials in, on, under or about the Premises or any part thereof, Tenant shall, immediately, at no expense to City, take any and all appropriate actions to return the Premises or other part of the Property affected thereby to the condition existing prior to such Release and otherwise Investigate and Remediate the Release in accordance with all

Environmental Laws. Tenant shall afford City a full opportunity to participate in any discussions with governmental regulatory agencies regarding any settlement agreement, cleanup or abatement agreement, consent decree, or other compromise or proceeding involving Hazardous Material.

24. SECURITY DEPOSIT

24.1 **Security Deposit**. Tenant shall pay to City upon execution of this Lease the sum specified for the security deposit in the Basic Lease Information as security for the faithful performance of all terms, covenants and conditions of this Lease. Tenant agrees that City may (but shall not be required to) apply the security deposit in whole or in part to remedy any damage to the Premises or City Facilities caused by Tenant, its Agents or Invitees, or any failure of Tenant to perform any other terms, covenants or conditions contained in this Lease, without waiving any of City's other rights and remedies hereunder or at Law or in equity. Should City use any portion of the security deposit to cure any Event of Default by Tenant hereunder, Tenant shall immediately replenish the security deposit to the original amount, and Tenant's failure to do so within five (5) days of City's notice shall constitute a material Event of Default under this Lease. City's obligations with respect to the security deposit are solely that of debtor and not trustee. City shall not be required to keep the security deposit separate from its general funds, and Tenant shall not be entitled to any interest on such deposit. The amount of the security deposit shall not be deemed to limit Tenant's liability for the performance of any of its obligations under this Lease.

24.2 **Performance Bond; Letter of Credit.** In lieu of the security deposit provided in Section 24.1 above, Tenant may deliver to City (i) a valid surety bond in the sum equal to amount specified, issued by a surety company acceptable to City's Controller in such form as approved by the City Attorney of City or (ii) a "clean" (i.e., unconditional), irrevocable letter of credit issued by a financial institution acceptable to the CITY General Manager and in form approved by the City Attorney with an initial term of no less than one year and automatic extensions through the end of the Term of this Lease and thirty (30) days thereafter. Tenant shall keep such surety bond or letter of credit, at its expense, in full force and effect until the sixtieth (60th) day after the Expiration Date or other termination hereof, to insure, the faithful performance by Tenant of all of the covenants, terms and conditions of this Lease. Such bond or letter of credit shall provide thirty (30) days' prior written notice to City of cancellation or material change thereof. In the event of any nonextension of the letter of credit or bond, Tenant shall replace such security with another form permitted hereunder at least ten (10) days prior to expiration and if Tenant fails to do so City shall be entitled to present its written demand for payment of the entire face amount of such letter of credit or bond and to hold the funds so obtained as the Security Deposit required hereunder. Any unused portion of the funds so obtained by City shall be returned to Tenant upon replacement of the letter of credit or deposit of cash security in the full amount required hereunder.

25. GENERAL PROVISIONS

25.1 **Notices**. Except as otherwise expressly provided in this Lease, any notice given hereunder shall be effective only if in writing and given by delivering the notice in person, by sending it first-class mail or certified mail with a return receipt requested or overnight courier, return receipt requested, with postage prepaid, to: (a) Tenant at Tenant's address set forth in the Basic Lease Information, (b) City at City's address set forth in the Basic Lease Information; or (c) to such other address as either City or Tenant may designate as its new address for such purpose by notice given to the other in accordance with the provisions of this Section at least ten (10) days prior to the effective date of such change. Any notice hereunder shall be deemed to have been given two (2) days after the date when it is mailed if sent by first-class or certified mail, one day after the date it is made if sent by overnight courier, or upon the date personal delivery is made. For convenience of the Parties, copies of notices may also be given be telefacsimile to the telephone number set forth in the Basic Lease Information or such other number as may be provided from time to time; however, neither Party may give official or binding notice by facsimile. The effective time of a notice shall not be affected by the receipt, prior to receipt of the original, of a telefacsimile copy of the notice.

25.2 **No Implied Waiver**. No failure by City to insist upon the strict performance of any obligation of Tenant under this Lease or to exercise any right, power or remedy arising out of a breach thereof, irrespective of the length of time for which such failure continues, no acceptance of full or partial Base Rent or Additional Charges during the continuance of any such breach, and no acceptance of possession of the Premises prior to the expiration of the Term by City or any of its Agents, shall constitute a waiver of such breach or of City's right to demand strict compliance with such term, covenant or condition or operate as a surrender of this Lease. No express written waiver of any default or the performance of any provision hereof shall affect any other default or performance, or cover any other period of time, other than the default, performance or period of time specified in such express waiver. One or more written waivers of a default or the performance of any provision hereof shall not be deemed to be a waiver of a subsequent default or performance. The consent of City given in any instance under the terms of this Lease shall not relieve Tenant of any obligation to secure the consent of City in any other or future instance under the terms of this Lease.

25.3 **Amendments**. Neither this Lease nor any term or provisions hereof may be changed, waived, discharged or terminated, except by a written instrument signed by the Parties hereto.

25.4 **Tenant Authority**. If Tenant signs as a corporation or a partnership, each of the persons executing this Lease on behalf of Tenant does hereby certify, covenant and warrant that Tenant is a duly authorized and existing entity, that Tenant has and is qualified to do business in California, that Tenant has full right and authority to enter into this Lease, and that each and all of the persons signing on behalf of Tenant are authorized to do so. Upon City's request, Tenant shall provide City with evidence reasonably satisfactory to City confirming the foregoing representations and warranties.

25.5 **Joint and Several Obligations**. The word "Tenant" as used herein shall include the plural as well as the singular. If there is more than one Tenant, the obligations and liabilities under this Lease imposed on Tenant shall be joint and several.

25.6 **Interpretation of Lease**. The captions preceding the articles and sections of this Lease and in the table of contents have been inserted for convenience of reference only and such captions shall in no way define or limit the scope or intent of any provision of this Lease. This Lease has been negotiated at arm's length and between persons sophisticated and knowledgeable in the matters dealt with herein and shall be interpreted to achieve the intents and purposes of the Parties, without any presumption against the party responsible for drafting any part of this Lease. Provisions in this Lease relating to number of days shall be calendar days, unless otherwise specified, provided that if the last day of any period to give notice, reply to a notice or to undertake any other action occurs on a Saturday, Sunday or a bank or City holiday, then the last day for undertaking the action or giving or replying to the notice shall be the next succeeding business day. Use of the word "including" or similar words shall not be construed to limit any general term, statement or other matter in this Lease, whether or not language of non-limitation, such as "without limitation" or similar words, are used. Unless otherwise provided herein, whenever the consent of City is required to be obtained by Tenant hereunder, City may give or withhold such consent in its sole and absolute discretion.

25.7 **Successors and Assigns**. Subject to the provisions of Section 16 hereof relating to Assignment and Subletting, the terms, covenants and conditions contained in this Lease shall bind and inure to the benefit of City and Tenant and their personal representatives and successors and assigns.

25.8 **Severability**. If any provision of this Lease or the application thereof to any person, entity or circumstance shall, to any extent, be invalid or unenforceable, the remainder of this Lease, or the application of such provision to persons, entities or circumstances other than those as to which it is invalid or unenforceable, shall not be affected thereby, and each other provision of this Lease shall be valid and be enforceable to the fullest extent permitted by Law.

25.9 **Governing Law**. This Lease shall be construed and enforced in accordance with the Laws of the State of California.

25.10 **Entire Agreement**. This instrument (including the exhibits hereto, which are made a part of this Lease) contains the entire agreement between the Parties and supersedes all prior written or oral negotiations, discussions, understandings and agreements. The Parties further intend that this Lease shall constitute the complete and exclusive statement of its terms and that no extrinsic evidence whatsoever (including prior drafts of this Lease and any changes therefrom) may be introduced in any judicial, administrative or other legal proceeding involving this Lease. Tenant hereby acknowledges that neither City nor City's Agents have made any representations or warranties with respect to the Premises or this Lease except as expressly set forth herein, and no rights, easements or licenses are or shall be acquired by Tenant by implication or otherwise unless expressly set forth herein.

25.11 Attorneys' Fees. In the event that either City or Tenant fails to perform any of its obligations under this Lease or in the event a dispute arises concerning the meaning or interpretation of any provision of this Lease, the defaulting party or the party not prevailing in such dispute, as the case may be, shall pay any and all costs and expenses incurred by the other party in enforcing or establishing its rights hereunder (whether or not such action is prosecuted to judgment), including, without limitation, court costs and reasonable attorneys' fees. For purposes of this Lease, reasonable fees of attorneys of City's Office of the City Attorney shall be based on the fees regularly charged by private attorneys with the equivalent number of years of experience in the subject matter area of the law for which the City Attorney's services were rendered who practice in the City of San Francisco in law firms with approximately the same number of attorneys as employed by the Office of the City Attorney.

25.12 Holding Over. Any holding over after the expiration of the Term with the express consent of City shall be construed to automatically extend the Term of this Lease on a month-to-month basis. Base Rent shall be continued to be based on the total allowable Base Grazing Capacity; however, each AUM shall be valued at ____________ ($_____). Terms and conditions of the Lease shall otherwise be the same during the holdover period herein specified so far as applicable. Any holding over without City's consent shall constitute a default by Tenant and entitle City to exercise any or all of its remedies as provided herein, notwithstanding that City may elect to accept one or more payments of Base Rent.

25.13 Time of Essence. Time is of the essence with respect to all provisions of this Lease in which a definite time for performance is specified.

25.14 Cumulative Remedies. All rights and remedies of either party hereto set forth in this Lease shall be cumulative, except as may otherwise be provided herein.

25.15 Survival of Indemnities. Termination of this Lease shall not affect the right of either party to enforce any and all indemnities and representations and warranties given or made to the other party under this Lease, nor shall it affect any provision of this Lease that expressly states it shall survive termination hereof.

25.16 Status of Parties. City is not, and none of the provisions in this Lease shall be deemed to render City, a partner in Tenant's business, or joint venturer or member in any joint enterprise with Tenant. Neither party shall act as the agent of the other party in any respect hereunder, and neither party shall have any authority to commit or bind the other party without such party's consent as provided herein. This Lease is not intended nor shall it be construed to create any third party beneficiary rights in any third party, unless otherwise expressly provided.

25.17 No Recording. Tenant agrees that it shall not record this Lease nor any memorandum or short form hereof in the Official Records.

25.18 Non-Liability of City Officials, Employees and Agents. No elective or appointive board, commission, member, officer, employee or other Agent of City shall be personally liable to Tenant, its successors and assigns, in the event of any default or breach by City

or for any amount which may become due to Tenant, its successors and assigns, or for any obligation of City under this Agreement.

25.19 Wages and Working Conditions. With respect to the construction of any permitted Improvements, any employee performing services for Tenant shall be paid not less than the highest prevailing rate of wages, shall be subject to the same hours and working conditions, and shall receive the same benefits as in each case are provided for similar work performed in the counties where the Premises are located.

25.20 Non-Discrimination in City Contracts and Benefits Ordinance.

(a) Covenant Not to Discriminate. In the performance of this Lease, Tenant covenants and agrees not to discriminate on the basis of the fact or perception of a person's race, color, creed, religion, national origin, ancestry, age, sex, sexual orientation, gender identity, domestic partner status, marital status, disability or Acquired Immune Deficiency Syndrome or HIV status (AIDS/HIV status) against any employee of, any City employee working with, or applicant for employment with Tenant, in any of Tenant's operations within the United States, or against any person seeking accommodations, advantages, facilities, privileges, services, or membership in all business, social, or other establishments or organizations operated by Tenant.

(b) Subleases and Other Subcontracts. Tenant shall include in all Subleases and other subcontracts relating to the Premises a non-discrimination clause applicable to such Subtenant or other subcontractor in substantially the form of subsection (a) above. In addition, Tenant shall incorporate by reference in all subleases and other subcontracts the provisions of Sections 12B.2(a), 12B.2(c)-(k), and 12C.3 of the San Francisco Administrative Code and shall require all subtenants and other subcontractors to comply with such provisions. Tenant's failure to comply with the obligations in this subsection shall constitute a material breach of this Lease.

(c) Non-Discrimination in Benefits. Tenant does not as of the date of this Lease and will not during the Term, in any of its operations in San Francisco or where the work is being performed for the City or elsewhere within the United States, discriminate in the provision of bereavement leave, family medical leave, health benefits, membership or membership discounts, moving expenses, pension and retirement benefits or travel benefits, as well as any benefits other than the benefits specified above, between employees with domestic partners and employees with spouses, and/or between the domestic partners and spouses of such employees, where the domestic partnership has been registered with a governmental entity pursuant to state or local law authorizing such registration, subject to the conditions set forth in Section 12B.2(b) of the San Francisco Administrative Code.

(d) Condition to Lease. As a condition to this Lease, Tenant shall execute the "Chapter 12B Declaration: Nondiscrimination in Contracts and Benefits" form (Form HRC-12B-101) with supporting documentation and secure the approval of the form by the San Francisco Human Rights Commission.

(e) Incorporation of Administrative Code Provisions by Reference. The provisions of Chapters 12B and 12C of the San Francisco Administrative Code relating to non-discrimination by parties contracting for the lease of City property are incorporated in this Section by reference and made a part of this Agreement as though fully set forth herein. Tenant shall comply fully with and be bound by all of the provisions that apply to this Lease under such Chapters of the Administrative Code, including but not limited to the remedies provided in such Chapters. Without limiting the foregoing, Tenant understands that pursuant to Section 12B.2(h) of the San Francisco Administrative Code, a penalty of $50 for each person for each calendar day during which such person was discriminated against in violation of the provisions of this Lease may be assessed against Tenant and/or deducted from any payments due Tenant.

25.21 **No Relocation Assistance**. This Lease creates no right in Tenant to receive any relocation assistance upon any termination of tenancy except as otherwise provided in this Lease with respect to a Taking.

25.22 **MacBride Principles - Northern Ireland**. City urges companies doing business in Northern Ireland to move toward resolving employment inequities and encourages them to abide by the MacBride Principles as expressed in San Francisco Administrative Code Section 12F.1, et seq. City also urges San Francisco companies to do business with corporations that abide by the MacBride Principles. Tenant acknowledges that it has read and understands the above statement of City concerning doing business in Northern Ireland.

25.23 **Conflicts of Interest**. Tenant states that it is familiar with the provisions of Section 8.105 and 8.106 of the San Francisco Charter and certifies that it knows of no facts which would constitute a violation of such provisions. Tenant further certifies that it has made a complete disclosure to the PUC of all facts bearing upon any possible interest, direct or indirect, which Tenant believes any member of the PUC, or other officer or employee of City, presently has or will have in this Lease or in the performance thereof. Willful failure to make such disclosure, if any, shall constitute a material default hereunder.

25.24 **Charter Provisions**. This Lease is governed by and subject to the provisions of the Charter of City.

25.25 **Tropical Hardwood Ban**. City urges companies not to import, purchase, obtain or use for any purpose, any tropical hardwood or tropical hardwood product.

25.26 **Burma (Myanmar) Business Prohibition** Contractor is not the government of Burma (Myanmar), a person or business entity organized under the laws of Burma (Myanmar) or a "prohibited person or entity" as defined in Section 12J.2(G) of the San Francisco Administrative Code. The City reserves the right to terminate this Contract for default if the Contractor violates the terms of this section.

Chapter 12J of the San Francisco Administrative Code is hereby incorporated by reference as though fully set forth herein. The failure of Contractor to comply with any of its requirements shall be deemed a material breach of contract. In the event that Contractor fails to comply in good

faith with any of the provisions of Chapter 12J of the San Francisco Administrative Code, Contractor shall be liable for liquidated damages for each violation in an amount equal to Contractor's net profit under the contract, or 10% of the total amount of the contract, or $1,000, whichever is greatest. Contractor acknowledges and agrees that the liquidated damages assessed shall be payable to the City upon demand and may be set off against any moneys due to the Contractor from any City contract.

25.27 Counterparts. This Lease may be executed in two or more counterparts, each of which shall be deemed an original, but all of which taken together shall constitute one and the same instrument.

25.28 Effective Date. This Lease shall become effective on the date (the "**Effective Date**") upon which (i) City's Public Utilities Commission enacts a resolution approving this Lease, in accordance with all applicable Laws, and (ii) the Parties hereto have duly executed this Lease.

25.29 City Authority. **NOTWITHSTANDING ANYTHING TO THE CONTRARY CONTAINED IN THIS LEASE, TENANT ACKNOWLEDGES AND AGREES THAT NO OFFICER OR EMPLOYEE OF CITY HAS AUTHORITY TO COMMIT CITY HERETO UNLESS AND UNTIL A RESOLUTION OF CITY'S PUBLIC UTILITIES COMMISSION SHALL HAVE BEEN DULY ENACTED APPROVING THIS LEASE AND AUTHORIZING THE TRANSACTIONS CONTEMPLATED HEREBY. THEREFORE, ANY OBLIGATIONS OR LIABILITIES OF CITY HEREUNDER ARE CONTINGENT UPON ENACTMENT OF SUCH A RESOLUTION, AND THIS LEASE SHALL BE NULL AND VOID UNLESS CITY'S PUBLIC UTILITIES COMMISSION APPROVES THIS LEASE, IN THEIR RESPECTIVE SOLE AND ABSOLUTE DISCRETION, AND IN ACCORDANCE WITH ALL APPLICABLE LAWS.**

City and Tenant have executed this Lease, in triplicate, as of the date first written above.

TENANT:

____

CITY:

CITY AND COUNTY OF SAN FRANCISCO,
a municipal corporation

____
General Manager
Public Utilities Commission

APPROVED BY
PUBLIC UTILITIES COMMISSION
PURSUANT TO RESOLUTION NO. ________
ADOPTED ______________________________

____
Secretary

APPROVED AS TO FORM:

LOUISE H. RENNE,
City Attorney

By ______________________________
Deputy City Attorney

EXHIBIT A

REAL PROPERTY DESCRIPTION

EXHIBIT B

DRAWING NO. ___________
CONSISTING OF ____ PAGE(S)

EXHIBIT C

MONUMENTS

EXHIBIT D

COST SCHEDULE

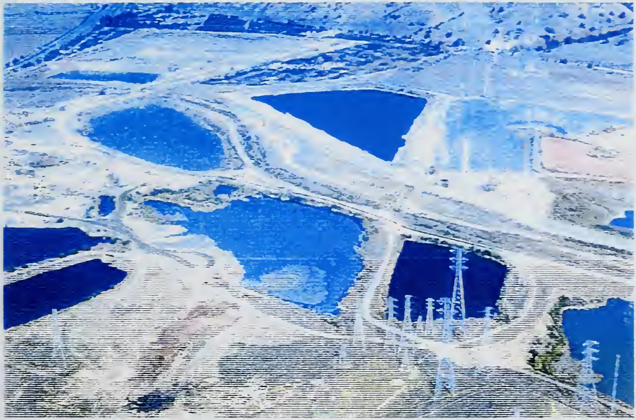
EXHIBIT E

FORM OF GRAZING REPORT

Appendix A-3

Sunol Valley Resources
Management Element
November 1998

Sunol Valley Resources Management Element



Prepared for

San Francisco Public Utilities Commission

Prepared by

EDAW, Inc.
Bookman-Edmonston Engineering
Ludorff and Scalmanini
Montgomery Watson
Environmental Science Associates
Public Affairs Management

November 1998

Sunol Valley Resources Management Element

Prepared for

San Francisco Public Utilities Commission

Prepared by

EDAW, Inc.
Bookman-Edmonston Engineering
Ludorff and Scalmanini
Montgomery Watson
Environmental Science Associates
Public Affairs Management

November 1998

TABLE OF CONTENTS

Chapter 1: Introduction 1
1.1 Purpose and Intent 1
1.2 Goals and Subgoals 1
Overall Goal 1
Subgoals 1
1.3 History and Planning Process 2
1.4 Summary of Existing Conditions 4
Location 4
Existing and Proposed Activities 4
Aggregate Mining 5
Existing Utilities 5
Nurseries/Agriculture 5
Cultural Resources 5
Recreation Activities 6
SFPUC Facilities 6
Adjacent Land Uses 6

Chapter 2: Sunol Valley Resources Management Plan Description, Policies and Management Actions 7
2.1 Plan Description 7
2.2 Policies 8
2.3 Management Actions and Guidelines 8
Gravel Mineral Resources: North of I-680 8
Gravel Mineral Resources: South of I-680 9
Reservoir Design Considerations 9
Reservoir Operations 9
Water Quality Monitoring 10
SFPUC Facilities 10
Recreation and Other Activities: North of I-680 11
Recreation and Other Activities: South of I-680 12
Economic Resources 12

Chapter 3: Sunol Valley Resource Management Alternatives 13
3.1 Introduction 13
3.2 Alternative A 13
3.3 Alternative B 14
3.4 Alternative C 14
3.5 Alternative D 15
3.6 Alternative E 16
3.7 Alternative F 17
3.8 Comparison Between Alternatives A, E and F 18
Pit Configuration, Leasing and Phasing 18
Comparative Cumulative Gross Mining Revenue 19
Comparative Cumulative Usable Water Storage 19
3.9 North of I-680: Pit E1 Restored to Pit F1 19

Chapter 4: Figures and Tables 20
Figure 1: Sunol Valley Location Map
Figure 2: Existing Conditions
Figure 3: Sunol Valley Mining Permits and Leases
Figure 4: Sunol Valley Resources Management Element: Alternative A
Figure 5: Sunol Valley Resources Management Element: Alternative B
Figure 6: Sunol Valley Resources Management Element: Alternative C
Figure 7: Sunol Valley Resources Management Element: Alternative D
Figure 8: Sunol Valley Resources Management Element: Alternative E
Figure 9: Sunol Valley Resources Management Element: Alternative F
Figure 10: Comparative Gross Mining Revenue and Usable Water Storage: Alternative A
Figure 11: Comparative Gross Mining Revenue and Usable Water Storage: Alternative E
Figure 12: Comparative Gross Mining Revenue and Usable Water Storage: Alternative F
Figure 13: Sunol Valley Phasing Diagram: Mining and Water Storage North of I-680: Pit E1 Restored to Pit F1/South of I-680: Alternative F

Table 1: Comparison Between Alternatives

REFERENCES

APPENDIX

Meeting Summaries and Minutes
SFPUC Meeting Minutes: March 12, 1996
SFPUC Meeting Minutes: March 26, 1996
SFPUC Meeting Minutes: April 9, 1996
SFPUC Meeting Minutes: May 14, 1996

Meeting Graphics
Regional Recreation
Is It Possible to Convert a Gravel Quarry to Water Storage and a Recreation Amenity: Some Successful Examples
Comparable Scales
Representative Sections

CHAPTER 1: INTRODUCTION

1.1 Purpose and Intent

The purpose of the Sunol Valley Resources Management Element (SVRME) is to address the complex mix of activities in the Sunol Valley in a comprehensive manner, and to address the existing and future activities of the Sunol Valley while minimizing the conflicts between these activities. These activities include potable and non-potable water storage; water quality protection; water release and recapture facilities; Sunol Treatment Plant operations and support facilities; gravel operations and other revenue generating activities; Alameda operations facilities; natural and cultural resources; fisheries enhancement; and potential recreation resources.

The San Francisco Public Utilities Commission (SFPUC) initiated this study of the Sunol Valley in May, 1995 as a part of the SFPUC's larger undertaking - the San Francisco Watershed Management Plans. The findings of this study are integrated into the Alameda Watershed Management Plan (Plan). EDAW, Inc. is preparing both the overall management plan and this focused Sunol Valley effort. EDAW was assisted in the preparation of this element by Bookman-Edmonston Engineering, Luhdorff and Scalmanini, Environmental Science Associates, Montgomery Watson, and Public Affairs Management.

The SVRME is a conceptual, programmatic, pre-reconnaissance level study only, to determine the feasibility of developing water storage in the Sunol Valley. The policies and management actions set forth in this Element and in the Plan will be analyzed at a programmatic level in the Alameda Watershed Management Plan Environmental Impact Report (EIR). Exact pit configurations, water sources, piping layouts, treatment plant connections, recreation and commercial activities and other related plan elements have not been determined and will require further project-level planning. The conceptual plans set forth in this document may change significantly following specific project-level analysis. This document may also identify activities which may or may not be executed subject to funding and further environmental analysis.

1.2 Goals and Subgoals

The goals and subgoals for the Sunol Valley represent the complex and interrelated issues facing management of the Sunol Valley and are derived from and compatible with the goals set forth for the Alameda Watershed management planning process as a whole.

Overall Goal

- Optimize water storage for the SFPUC thus increasing the yield and the reliability of the water supply.

Subgoals

- Manage the timing and location of quarry development to expedite the creation of water storage facilities while minimizing the impacts to natural, cultural and aesthetic resources, and maximizing revenues from gravel extraction and other revenue sources (e.g. increased water sales, recreation, intensified permanent crops and nurseries).

- Protect the quality of the water that migrates into the reclaimed quarry pits, circulates through the system, is discharged from the pits into stream courses, and/or is pumped into the system.

- Protect the quantity of water while in storage and minimize the loss of water. Minimize the release of water that cannot be recaptured.

- Investigate the potential of quarry sites to support Sunol Water Treatment plant functions and to store non-potable water for non-potable uses.

- Analyze the impacts and mitigate as necessary the significant environmental impacts of the management plan actions on Sunol Valley resources including natural and cultural resources, adjacent communities and other land uses.

- Develop a strategy for negotiating future leases, County permits, reclamation plans and other agreements to implement the Sunol Valley Resources Management Plan.

- Provide the opportunity for land and water based recreation in the Sunol Valley compatible with water quality and water storage goals, with natural and cultural resources and with the SFPUC facility objectives.

- Involve interested agencies and members of the public in the planning process.

- Inform and educate the public about water and other resource values.

- Establish an internal the SFPUC review committee, composed of representatives from the affected SFPUC departments, to promote integrated systems planning and management.

1.3 History and Planning Process

As part of the San Francisco Watershed Management Planning process, the SFPUC prepared the SVRME to address the management of water resources; gravel mineral resources; SFPUC facilities; cultural, agricultural and economic resources; recreation and park facilities; and fisheries in the Alameda Creek corridor within the SFPUC Alameda Watershed lands.

The overall Watershed Management Preferred Alternative was approved by the SFPUC on January 26, 1995. The Watershed Management Preferred Alternative provided general guidance regarding the development of quarries in the Sunol Valley as follows:

- Mine existing pits deeper
- Expand operations south of I-680
- Consider expansion north of I-680 consistent with SMP-32
- Accelerate reclamation
- Restore quarries for water storage and potential non-body contact recreational use

In order to look comprehensively at the entire valley, its many activities and opportunities, especially the opportunity to provide water storage in the completed quarries, the SFPUC approved, in May, 1995, further study of the Sunol Valley in the form of the SVRME.

To initiate the planning process, the goals and subgoals for the SVRME, presented in Chapter 1.2, were established in a kick-off meeting with the Watershed Planning Committee, a group of SFPUC staff members representing various departments and divisions. The goals and subgoals represent the complex and interrelated management issues which must be addressed for the Sunol Valley. The goals and subgoals are also compatible with the goals set forth for the Alameda Watershed as a whole.

The first of two rounds of agency and public workshops was held on June 29, 1995 to provide information and receive comments from agencies, stakeholder groups, the Sunol community and other interested parties. The goals and subgoals of the SVRME were presented for comment at these meetings.

Based upon the goals and subgoals for the SVRME and on the comments received at the June 29, 1995 workshops, three conceptual alternatives (Alternatives A, B and C) were developed for the Sunol Valley. Each of these alternatives is described in detail in Chapter 3. In developing these alternatives the major emphasis was the exploration of the range of water storage, recreation, and revenue generation possibilities in the Sunol Valley. In addition to the three alternatives, scale comparisons between the Sunol Valley and other water recreation areas were prepared. These items are included in the Appendix.

The second round of agency and public workshops was held on August 10, 1995 to present the three conceptual alternatives (Alternatives A, B and C) for discussion with the agencies and the Sunol community. Public sentiment generally favored Alternative B which allowed no mining north of I-680 and included recreational, agricultural and other revenue generating activities in this area to offset the lost mining revenue.

Based upon the comments received at the August 10 public workshop as well as input from the Watershed Planning Committee, a fourth alternative, Alternative D, was prepared. Alternative D is described in detail in Chapter 3.5.

Following the issuance of Alternative D, a fifth alternative, now termed Alternative E was put forward by Mission Valley Rock, the company which leases much of the Sunol Valley from the SFPUC for aggregate mining. Alternative E honors SMP-32 north of I-680 and is less aggressive than Alternative D in terms of water storage south of I-680. Alternative E is described in detail in Chapter 3.6. SMP-32 is the surface mining permit issued to Mission Valley Rock by Alameda County in early 1995 for mining 200-acres north of I-680. Prior to issuance of SMP-32, Mission Valley Rock had a permit to mine only 69-acres (SMP-29) north of I-680. The SMP-32 permit superceded SMP-29. In order to actually mine any portion of this area, a lease from the SFPUC is also required. The SFPUC has issued a lease for SMP-29 but not for SMP-32. Alternative A and Alternative D included SMP-29. Alternative C and Alternative F included a slightly modified SMP-32. Alternative E included SMP-32 as it was originally proposed.

In response to Alternative E, Alternative F was prepared. North of I-680, Alternative F took exception to the extent of mining and the proximity of the pit edge to the Sunol Water Temple and possible buried cultural resources in the vicinity of the temple. In response, Alternative F proposed a 1/4-mile (1320') setback from the temple to the mined areas. Alternative F also provided greater landscape screening around the pit and a larger interpretive area. South of I-680, Alternative F is the same as Alternative D in its attempts to maximize water storage Alternative F is described in chapter 3.7.

On March 12, 1996 these six alternatives were presented to the SFPUC with the intent of selecting a preferred alternative for the Sunol Valley to incorporate into the Alameda Watershed Management Plan. This meeting consisted of a presentation of the six alternatives followed by an opportunity for the public to comment on the alternatives. Discussion on the preferred alternative by the SFPUC was carried

forward to the SFPUC meeting on March 26, 1996. At the March 26, 1996 meeting, the SFPUC asked for additional information regarding a comparison between Alternatives A, E and F in terms of phasing, tons of aggregate and revenue. This comparison is discussed in detail in Chapter 3.8. This comparative information was presented to the SFPUC on April 9, 1996. Public comment was also taken at this meeting. Following the public comment period, the SFPUC requested more information regarding the area north of I-680. Specifically, they requested information on the timing and phasing implications of mining the entirety of Pit E1 and reclaiming the pit back to the configuration of Pit F1, thereby reinstating the ¼ mile buffer around the Sunol Temple. This comparison is described in Chapter 3.9 and was presented to the SFPUC at the May 14, 1996 meeting. A final decision was also made on the SVRME preferred alternative at this meeting. The preferred alternative, approved by the SFPUC, and the policies and management actions developed in support of the preferred alternative are described in detail in Chapter 2.

The preferred alternative is worded as follows; "North of Freeway I-680, mine for gravel extraction as described in Alternative E and restore and manage the area as described in Alternative F, including landscape and recreation plans that provide for the restoration of the Sunol Water Temple, its historic entry, and public use of the temple area which are to be jointly approved by the General Manager of the Public Utilities Commission and Alameda County, and then restored at the completion of mining. South of Freeway I-680 two options are hereby identified: Option 1 is to mine for gravel extraction and restore and manage the areas as described in Alternative F; Option 2 is to mine for gravel extraction within the currently permitted areas to a depth of 200 feet and restore and manage the area as described in Alternative F."

1.4 Summary of Existing Conditions

Location

The Sunol Valley consists of approximately 1,350 acres and is bounded generally by Paloma Way and Niles Canyon Road to the north, Calaveras Road to the east, the Sunol WTP on the south, and Alameda Creek on the west. These lands are located within the secondary watershed. The secondary watershed consists of lands where runoff enters Alameda Creek below the proposed Water Release and Recapture Facility and is not recaptured and does not enter SFPUC reservoirs.

The planning area is generally divided into two areas—the lands north of I-680 and lands south of I-680. Major roads in the Sunol Valley include I-680, which bisects the study area in an east-west direction, and several local roads - Calaveras Road, Paloma Way and Niles Canyon. Alameda Creek passes through the study area; the segment between the Hetch Hetchy Aqueduct and I-680 runs in a riprapped channel. San Antonio Creek is a dry creek which connects with Alameda Creek. Figure 1, included in Chapter 4 of this document, illustrates the Sunol Valley context.

Existing and Proposed Activities

The SFPUC owns most of the land within the Sunol Valley and currently leases most of it for a variety of ongoing activities including: gravel extraction (by Surface Mining Permit from Alameda County and lease from SFPUC), agricultural activities, plant nurseries, and utility corridors. SFPUC facilities and operations in the Sunol Valley include the Sunol Water Temple, SFPUC East Bay Operations Facilities, the Hetch Hetchy Aqueduct, and the Sunol Water Treatment Plant (WTP). Each of these types of

activities is described below. Figure 2, included in Chapter 4 of this document, illustrates the existing activities in the Sunol Valley.

Proposal activities in the Sunol Valley include the Water Release and Recapture Facility. The facility and its environmental effects are being addressed separately from the SVRME. The facility will be developed under Memorandum of Understanding (MOU) with the California Department of Fish and Game (CDFG). This facility will allow water releases from Calaveras Resevoir into Calavares and Alameda Creeks to balance enhancement of trout fisheries with maintenance of non-native game fisheries. These releases will also improve riparian vegetation. SFPUC would recapture these releases, to be used as part of the water supply, at a surface impoundment just downstream from the Sunol WTP. A conceptual engineering report for the fish release and recapture facility was completed in June 1997. Detailed design and environmental review of the facility should commence within the coming year.

Aggregate Mining

The SFPUC has leased lands in the Sunol Valley lands for gravel quarry operations since the 1960s to two quarry operators - Mission Valley Rock and RMC Lone Star. Active aggregate mining encompasses approximately 500-acres of the Sunol Valley. This use generates annual revenue for the SFPUC. Figure 3, included in Chapter 4 of this document, illustrates the existing mining permits and leases in the Sunol Valley.

Existing Utilities

Both the SFPUC and several private companies have utility lines running through the Sunol Valley. In the north end of the valley, adjacent to I-680 is an underground PG&E gas pipeline and, adjacent to it, the PG&E overhead electrical transmission lines. Another set of PG&E transmission lines crosses the valley further south, adjacent to the SFPUC Hetch Hetchy Power transmission lines. The South Bay Aqueduct also crosses the valley in this vicinity. The Hetch Hetchy Aqueduct crosses the valley in the southern portion of the valley. These major utilities were illustrated in Figure 2. The Chevron Pipeline parallels the Calaveras Road through most of the Valley and then crosses the Valley just north of the proposed Water Release and Recapture Facility. In addition to the major utility lines, the SFPUC also has a number of smaller water supply lines which run adjacent to Calavares Road and in other locations throughout the valley.

Nurseries/Agriculture

Approximately 220 acres of the SFPUC's Sunol Valley lands are leased to plant nurseries. These leases are either held directly with the SFPUC or are a sublease with one of the mining companies. Some of these nurseries are viewed as temporary uses until it becomes feasible to mine the aggregate beneath them. The existing nursery leases are indicated in Figure 3.

Cultural Resources

Archeological evidence suggests that the Sunol Valley area was a favorable locale for permanent as well as seasonal habitation from prehistoric times to the ethno-historic period. Creeks in the Sunol Valley have been identified as excellent locations for these archeological resources. More research is required to accurately determine existing resources. Historic features and structures are scattered throughout the Sunol Valley with the most well-known and documented of these being the Sunol Water Temple which

was built in 1910 to mark the confluence of the three water sources - Alameda Creek, Arroyo de la Laguna and the Pleasanton Wells.

Recreation Activities

Few recreation activities currently exist in the Sunol Valley due to the mining which occurs throughout much of the Valley. A picnic area with public restrooms is located around the Sunol Temple but has been closed since the 1989 Loma Prieta earthquake due to the seismic retrofitting of the Temple.

SFPUC Facilities

SFPUC facilities in the Sunol Valley include the Sunol Operations facility, the Hetchy Hetchy Aqueduct, the Sunol Water Temple, Hetch Hetchy Power lines, the Sunol WTP, and the Sunol Pump Station and Infiltration Galleries. These facilities are indicated in Figure 2. Selected system upgrades which are contemplated for the future may include: Substation Relocation; Chevron Pipeline retrofitting; Balancing Reservoir siting; pipeline expansion areas; Ozone Treatment Plant siting; additional Calaveras Road pipelines; Water Release and Recapture Facility; the expansion of the Sunol WTP, and upgrades and possible relocation of the East Bay Operations Facilities. These projects are only in the early planning stages and may or may not be executed in the future.

Adjacent Land Uses

Land uses immediately adjacent to the Sunol Valley include the Sunol Valley Golf Course located west of the study area adjacent to I-680 and the East Bay Regional Park District's (EBRPD) Sunol Regional Wilderness located south of the study area off of Calaveras Road. The EBRPD also has trails located in the Pleasanton Ridge Regional Recreation Area, located north of the study area. Hiking and fishing also occur in Niles Canyon north of the study area. Immediately west of Alameda Creek are lands owned by Mission Valley Rock which are used for aggregate mining as well as for Mission Valley Rock's processing plant.

CHAPTER 2: SUNOL VALLEY RESOURCES MANAGEMENT PLAN DESCRIPTION, POLICIES AND MANAGEMENT ACTIONS

2.1 Plan Description

The SVRME as identified by the SFPUC on May 14, 1996 is a hybrid of Alternatives E and F (described in Chapter 3). The SVRME provides a conceptual program for the future of the entire valley. In general, this program allows for the completion of existing permitted mining and reclaims the mined pits for water storage. Specifically, north of I-680, this program calls for completing mining of the existing permitted areas (SMP-32), with mining to be completed by approximately 2035. Upon completion of mining, one water storage pit with approximately 16,100 acre-feet (AF) of storage would remain in this area. Total mining revenue is estimated to be $22.7 million (1997 dollars). Restoration and landscaping of a ¼-mile buffer zone surrounding the water storage pit would also be completed.

Additional activities to be considered north of I-680 include:
- Restored Historic Entry (historic view corridor with orchards and native California landscape)
- Picnic and Day Use Areas
- Interpretive Area - Water Temple, Archaeological Sites
- Group Picnic Area and Parking
- Staging Area
- Alameda Creek Enhancement/Wildlife Area
- Trail Connections to Niles Canyon/Pleasanton Ridge (EBRPD)
- At Some Point in the Future a Working Farm/Vineyard/Nursery/Crops/Aquaculture/Wetlands; a Farmers Market; and/or Some Form of Water-Related, Non-Body Contact Recreation (e.g., Boating Facility - Boat Launch, Boat Rental, Concessionaire and/or Fishing Area - Shoreline Fishing, Fishing Pier may be considered. At this point these activities are conceptual in nature and may or may not occur in the future. Should these activities occur in the future a subsequent environmental review would be required.

South of I-680, two options are included in the conceptual program. Option 1 calls for some expansion of mining, which would require amendment of existing permits and leases. Mining is intended to be completed by 2021 and would provide 47,100 AF of water storage in five pits. Total mining revenue is estimated to be $45 million (1997 dollars). Other activities south of I-680 in Option 1 may include:
- commercial site;
- overnight nature study south of the Hetch Hetchy Aqueduct; and
- trail connections to the Sunol Regional Wilderness (EBRPD).

Option 2 calls for gravel extraction within the currently permitted areas to a depth of 200 feet. Under this option, mining would be completed by approximately 2014. Total water storage would be 38,800 AF in four pits with total estimated revenue of $32.7 million (1997 dollars). Other activities south of I-680 in Option 2 may include:
- commercial site;
- overnight nature study south of the Hetch Hetchy Aqueduct; and
- trail connections to the Sunol Regional Wilderness (EBRPD).

2.2 Policies

The following four policies pertain specifically to the Sunol Valley and are included in the Alameda Watershed Management Plan. Numerous other policies included in the Plan are also directly related to the water quality, water supply and watershed activities which will take place in the Sunol Valley.

Policy WA37 Manage the timing and location of mining in the Sunol Valley to expedite the creation of water storage facilities while minimizing the impacts to natural, cultural, and aesthetic resources, and maximizing revenues from gravel extraction and other revenue sources (e.g., increased water sales, recreation, vineyards, and nurseries).

Policy WA38 Promote the development of recreational amenities in the Sunol Valley, including water-based recreation, as compatible with future quarry water supply reservoirs.

Policy WA39 Prohibit body contact with water in the Sunol Valley reservoirs.

Policy WA40 Allow non-motorized boating and fishing in one of the Sunol Valley Reservoirs.

2.3 Management Actions and Guidelines

The management actions and guidelines for the Sunol Valley are identified below. The Alameda Watershed Management Plan also includes additional actions related to the Sunol Valley including lease requirements; design guidelines and accessibility compliance; and establishment of a Watershed Visitor and Education Center. Because these actions are not directly applicable to the SVRME, they are not included herein.

Management actions and guidelines that pertain to the Sunol Valley fall into the following categories:
- Gravel Mineral Resources: North of I-680
- Gravel Mineral Resources: South of I-680
- Reservoir Design Considerations
- Reservoir Operations
- Water Quality Monitoring
- SFPUC Facilities
- Recreation And Other Activities: North of I-680
- Recreation And Other Activities: South of I-680
- Economic Resources

Gravel Mineral Resources: North of I-680

Action sun1 Mine the existing permitted areas in accordance with SMP-32 with completion of mining by 2035. Prior to completion of mining, backfill the area adjacent to the Sunol Water Temple to provide a ¼-mile buffer area as additional mitigation for the visual and cultural resource impacts of SMP-32 on the temple area. Total water storage in this pit should be 16,100 AF once backfilling is complete.

Gravel Mineral Resources: South of I-680

Action sun2a (Option 1) To maximize water storage following the completion of mining, work with Alameda County to amend the existing mining permits south of I-680 to achieve a maximum mining depth of 200 feet and a maximum mining footprint.

Action sun2b (Option 2) To provide increased water storage following the completion of mining, work with Alameda County to amend the existing mining permits south of I-680 to increase the mining depth of existing permitted areas to 200 feet.

Reservoir Design Considerations

Action sun3 Upon completion of mining and in preparation of the quarry pits for water storage, design the reservoirs to meet the following guidelines for maintaining high water quality:

A. Reservoirs should be piped directly to the Sunol WTP or to San Antonio Reservoir from each pit rather than piped through other pits.
B. Include multiple port inlet and outlet towers for flexibility in modifying reservoir water quality.
C. Maintain steep reservoir slopes wherever possible to reduce macrophyte growth (vegetation in the reservoirs). Exceptions to this are areas where human activity is expected and steep sideslopes cause safety concerns.
D. Plant trees to provide a barrier to airborne particulate contaminants between proximate reservoirs and I-680.
E. Maintain cutoff slurry walls constructed during mining.

Action sun4 Due to the change in gradient of the valley floor south of I-680, create sideslopes on the pits such that there is a gradual transition to water (e.g., a beach with slope of 12:1) rather than a drop to water at the uphill edge of each pit. Where construction of beaches is not possible, construct attractive fencing to keep people from falling in.

Action sun5 Reclaim quarries with sideslopes appropriate to their proposed activity. Guidelines for activities and sideslopes are as follows:

A. Areas intended for human activity such as fishing and boating should be designed with a sideslope of 12:1.
B. Under normal operating conditions (i.e., non-drought or emergency conditions), land adjacent to the water's edge where human activity is expected to be less intense should be contoured to 12:1 for safety reasons but, maximize storage, may drop off rapidly to between 1.5:1 and 2:1 depending on geotechnical and slope conditions.

Reservoir Operations

Action sun6 In the event that the pits are used for the storage of potable water, maintain water quality during normal operations (i.e., during periods of non-emergency use) by operating the Sunol Valley reservoirs according to the following guidelines:

A. Operate the reservoirs so the water is piped directly to the treatment plant from each pit.
B. Minimize bank erosion caused by fluctuating water levels and the disruption of sediment by incoming water during initial filling and during refilling following a withdrawal.
C. Replace evaporation losses annually (anticipated to be approximately 2,300 AF/year).
D. Monitor water quality and withdraw water from the depth that provides the highest quality.
E. Annually remove macrophyte growth to reduce total organic carbon (TOC)
F. The reservoir used for fishing should be managed to favor predatory fish and minimize populations of planktivorous fish.
G. Public access reservoirs should have controls to minimize the introduction of pathogens to the reservoirs. Prohibit body contact recreation.
H. The use of copper sulfate for algae control should be avoided, but if needed should be added at the minimum effective dosage.

Action sun7 For safety reasons, suspend public access to the reservoirs when the reservoirs are drawn down due to drought or other emergency situation.

Water Quality Monitoring

Action sun8 As the reservoirs are filled, collect water quality data from the influent water. This analysis should include information on phosphorus, nitrogen, and metals, as well as the more typical parameters such as TOC and suspended solids.

Action sun9 Once the reservoirs are full, a sampling program should be followed that includes intensive sampling for the first year to identify the types and timing of water quality changes that occur. The sampling program should follow the guidelines below.

A. Sampling efforts should focus on suspected problems. For instance, a depth profile of dissolved oxygen, iron, and manganese concentrations will be important during the summer, while more frequent temperature profiles should be taken in the fall as the reservoir turns over.
B. Because each reservoir will have the flexibility to supply water from several depths, the monitoring program should identify the location of the highest quality water at any given time. If the reservoirs are well-characterized, it should not be necessary to manage the reservoirs to provide the highest quality water at all points at all times. For example, if algae and the associated taste and odor problems are controlled but artificial circulation is not adequate to eliminate anoxic conditions within a reservoir, water can be drawn from the epilimnion where metal concentrations are lower.

SFPUC Facilities

Action sun10 Retain the existing Sunol Maintenance Facility as the base for East Bay operations. The following improvements are recommended, but are conceptual in nature and may or may not occur. Should any or all of these improvements occur, subsequent environmental review will be required. Potential improvements to the Sunol Maintenance Facility include:

A. Replace or upgrade existing facilities:
   - Maintenance Garage
   - Trade shops and office to include crew and supervisors facilities sized for four crews plus supervisors
   - Equipment storage shelter sized for heavy equipment, trucks, and other miscellaneous equipment
   - Fueling facility
   - Warehouse and storage yard for storing construction and miscellaneous materials
   - Combination Watershed Office and Watershed Visitor Education Center including:
     - ◊ four offices
     - ◊ one large conference room
     - ◊ two small meeting rooms for daily meetings with watershed staff
     - ◊ file/map room.

B. Reconfigure parking and prepare auto circulation plan.

C. Improve security and fencing including lighting.

Recreation and Other Activities: North of I-680

Action sun11 Prior to completion of mining, restore and landscape a ¼-mile buffer zone surrounding the water storage pit.

Action sun12 Prepare a conceptual Landscape and Recreation Plan, as required by SMP-32, for the restoration and public use of the Sunol Water Temple, its environs, and historic entry.

Action sun13 Restore the historic entry to the Sunol Water Temple along Paloma Way as part of the Landscape and Recreation Plan required by SMP-32. Guidelines include:

A. Enhance the view to the temple.

B. Line the corridor with orchard-like planting.

C. Use native California landscape materials, where possible.

Action sun14 Develop a public recreation area around the Sunol Water Temple, as part of the Landscape and Recreation Plan required by SMP-32. This area should be developed according to the following guidelines:

A. Establish an interpretive center or area for interpretation of the Sunol Water Temple and the various archeological sites in the vicinity. Use this venue to inform and educate the public about water, and natural and cultural resources within the Sunol Valley as well as watershed wide.

B. Establish a group picnic area, and parking.

C. Establish a picnic and day-use area which may include picnic tables and barbecue facilities.

D. Adjacent to Alameda Creek, establish a creek enhancement and wildlife area. In conjunction with this include a short nature/interpretive trail through the wildlife area and trail connections to Niles Canyon and Pleasanton Ridge Regional Parks; include a staging area for these trails.

E. Provide linkages to the trail system south of I-680.

Action sun15 Prior to the design of any new or alteration of any existing public access trails, ensure that the following access and safety guidelines are met:

A. Consider public needs for convenience, access, and security when designing and siting trails and trailheads.
B. Consider use-levels on existing trails and projected demand for different trail uses.
C. Minimize user conflicts on trails through proper siting, design, maintenance, and an aggressive user safety program.

Action sun16 Explore the feasibility of developing one or more of the following adjacent to the water storage pit and/or adjacent to Alameda Creek along Niles Canyon Road: a working farm, a vineyard, nurseries, row crops, aquaculture, and/or wetlands.

Action sun17 To provide for universal access, construct and operate the recreation facilities and activities following the guidelines pertaining to accessibility for disabled persons.

Action sun18 Conduct periodic maintenance, as needed, on the Sunol Water Temple such that deterioration and alteration are avoided.

Recreation and Other Activities: South of I-680

Action sun19 Establish a small commercial site near the intersection of I-680 and Route 84 to provide limited supplies for visitors using the recreation facilities north of I-680 and the overnight nature study area.

Action sun20 Establish an overnight nature study area located in the Sunol Valley south of the Hetch Hetchy Aqueduct to provide educational programs for school children.

Action sun21 Establish trail connections extending to the Sunol Regional Wilderness and also link with the trail connections established north of I-680.

Economic Resources

Action sun22 Contract with a concessionaire, proven to be competent in the development and management of recreation facilities, to construct and operate the Sunol Valley recreation facilities so that the costs are not incurred by the rate payers.

CHAPTER 3: SUNOL VALLEY RESOURCE MANAGEMENT ALTERNATIVES

3.1 Introduction

As mentioned in Chapter 1, six alternatives were generated as part of the Sunol Valley Resources Management Element planning process. The preferred alternative (a combination of Alternatives E & F) selected by the SFPUC was discussed in Chapter 2. This chapter presents the alternatives prepared during the planning process. These alternatives are also being analyzed at the program-level in the Alameda Watershed EIR. The discussion of alternatives includes concept level estimates for revenue generation, water storage and phasing. However, because the SVRME is intended to be at a conceptual level, all numbers and information prepared for this analysis are for comparative purposes only.

3.2 Alternative A

Alternative A provides for the mining of existing permits and leases with mining to occur both north and south of I-680. Mining is expected to be completed in this scenario by 2015. Recreation activities in this alternative have been developed to generate revenue.

This alternative includes five water storage pits: one north of I-680 and four south of I-680. For comparative purposes, total water storage volume generated by this alternative, with pits mined to 200 feet, is 33,700 AF and total revenue generated by this alternative is $24.5M.

Potential activities have been identified for the land and water areas north of I-680. These activities are conceptual in nature and may or may not be executed in the future. Should any or all of these activities occur in the future, subsequent environmental review will be required. Potential activities north of I-680 include:

- Commercial Site - Gas/Groceries
- Farmers Market
- Organic Farm/Working Farm
- Overnight Nature Study
- Fishing Area/Aquaculture
- Landscaped Mounds
- Interpretive Area/Events Site - Water Temple, Archaeological Sites, Amphitheater, Picnic Area, Events Building
- Parking
- Staging Area
- Alameda Creek Enhancement/Wildlife Area
- Trail Connections to Niles Canyon/Pleasanton Ridge (EBRPD)

Potential activities have also been identified for the area south of I-680. These activities are conceptual in nature and may or may not be executed in the future. Should any or all of these activities occur in the future, subsequent environmental review will be required. Potential activities south of I-680 include:

- Group Picnic Area
- Boating Facility - Marina, Boat Launch, Boat Rental, Concessionaire
- Swimming Lagoon - Beach, Water Slide, Scuba Training, Picnic Area, Concessionaire
- RV Campground
- Trail Connections to Sunol Regional Wilderness

Figure 4 illustrates Alternative A and includes a table identifying the usable storage and mining revenue generated by each pit. Table 1 provides a comparison between Alternative A and the other five alternatives. All figures and tables are included in Chapter 4 of this document. Alternative A, as well as alternatives E and F, were studied in greater detail during the planning process at the request of the SFPUC. This additional analysis is discussed further in Section 3.8.

3.3 Alternative B

Alternative B provides for maximizing mining and storage south of I-680 with no mining planned north of I-680. Mining is to be completed by approximately 2036. In this alternative San Antonio Creek is removed to maximize storage and recreation and agricultural activities are proposed north of I-680 to generate revenue.

This alternative includes four water storage pits, all located south of I-680. The total water storage volume is 51,800 AF and total mining revenue is $53.4M.

Potential activities have been identified for the land area north of I-680 and the water and land areas south of I-680. These activities are conceptual in nature and may or may not be executed in the future. Should any or all of these activities occur in the future, subsequent environmental review will be required. Potential activities north of I-680 include:

- Commercial Site - Gas/Groceries
- Farmers Market
- RV Campground
- Organic Farm/Working Farm
- Overnight Nature Study
- Interpretive Area/Events Site - Water Temple, Archaeological Sites, Amphitheater, Picnic Area, Events Building
- Parking
- Staging Area
- Group Picnic Area
- Alameda Creek Enhancement/Wildlife Area
- Trail Connections to Niles Canyon/Pleasanton Ridge (EBRPD)

Potential activities have also been identified for the area south of I-680. These activities are conceptual in nature and may or may not be executed in the future. Should any or all of these activities occur in the future, subsequent environmental review will be required. Potential activities south of I-680 include:

- Boating Facility - Marina, Boat Launch, Boat Rental, Concessionaire
- Fishing Area - Shoreline Fishing, Fishing Pier
- Trail Connections to Sunol Regional Wilderness

Figure 5 illustrates Alternative B and includes a table identifying the usable storage and mining revenue generated by each pit. Table 1 provides a comparison between Alternative B and the other five alternatives. All figures and tables are included in Chapter 4 of this document.

3.4 Alternative C

Alternative C maximizes water storage both north and south of I-680. Mining is intended to be maximized south of I-680 before mining north of I-680 occurs. All mining is intended to be completed by 2047. San Antonio Creek is retained in this alternative and, due to the extent of mining, recreation activities are limited.

This alternative calls for six water storage pits, one north and five south of I-680. For comparative purposes, total water storage in this alternative is 62,600 AF and total mining revenue is $66.9M.

Due to the maximization of mining and water storage, recreation activities are limited in this alternative. Potential activities north of I-680 include:

- Commercial Site - Gas/Groceries
- Swimming Lagoon - Beach, Picnic Site, Concessionaire
- Landscaped Mounds and Buffers
- Wildlife Area
- Interpretive Area/Events Site - Water Temple, Archaeological Sites, Amphitheater, Picnic Area, Events Building
- Overnight Nature Study
- Staging Area
- Alameda Creek Enhancement/Wildlife Area
- Trail Connections to Niles Canyon/Pleasanton Ridge (EBRPD)

Potential activities have also been identified for the area. These activities are conceptual in nature and may or may not be executed in the future. Should any or all of these activities occur in the future, subsequent environmental review will be required. Potential activities south of I-680 include:

- Parking
- Boating Facility - Marina, Boat Launch, Boat Rental, Concessionaire
- Trail Connections to Sunol Regional Wilderness

Figure 6 illustrates Alternative C and includes a table identifying the usable storage and mining revenue generated by each pit. Table 1 provides a comparison between Alternative C and the other five alternatives. All figures and tables are included in Chapter 4 of this document.

3.5 Alternative D

Alternative D was created in response to the diverse public comments received at the August, 1995 public workshop. In this alternative, existing permits and leases are mined in the area north of I-680, quarrying and reclamation are expedited, and a conservation easement is placed over the entire area to preclude additional disturbance following reclamation. South of I-680, water storage is maximized, however, San Antonio Creek is retained as it is an important wildlife corridor. In this alternative, as well as in Alternatives E and F, the area north of Arroyo de la Laguna and south of the Hetch Hetchy Aqueduct have been added to the planning area.

A total of six storage pits, one north and five south of I-680 are proposed for this alternative. For comparative purposes, total water storage in this alternative is 52,300 AF and total mining revenue is $52.8M.

Potential activities have been identified for the land and water areas north of I-680. These activities are conceptual in nature and may or may not be executed in the future. Should any or all of these activities

occur in the future, subsequent environmental review will be required. Potential activities north of I-680 include:

- Farmers Market
- Organic Farm/Working Farm
- Boating Facility - Marina, Boat Launch, Boat Rental, Concessionaire
- Fishing Area - Shoreline Fishing, Fishing Pier
- Aquaculture
- Interpretive Area/Events Site - Water Temple, Archaeological Sites, Amphitheater, Picnic Area, Events Building
- Parking
- Staging Area
- Alameda Creek Enhancement/Wildlife Area
- Trail Connections to Niles Canyon/Pleasanton Ridge (EBRPD)

Potential activities have also been identified for the area south of the Hetch Hetchy Aqueduct. These activities are conceptual in nature and may or may not be executed in the future. Should any or all of these activities occur in the future, subsequent environmental review will be required. Potential activities south of the Hetch Hetchy Aqueduct include:

- Commercial Site - Gas/Groceries
- Trail Connections to Sunol Regional Wilderness

Potential activities have also been identified for the area. These activities are conceptual in nature and may or may not be executed in the future. Should any or all of these activities occur in the future, subsequent environmental review will be required. Potential activities south of the Hetch Hetchy Aqueduct include:

- RV Campground
- Overnight Nature Study

Figure 7 illustrates Alternative D and includes a table identifying the usable storage and mining revenue generated by each pit. Table 1 provides a comparison between Alternative D and the other five alternatives. All figures and tables are included in Chapter 4 of this document.

3.6 Alternative E

Alternative E reflects the terms of SMP-32 as approved by Alameda County. A lease for SMP-32 has not been issued by the SFPUC. Alternative E includes mining north and south of I-680. Existing SMP-32 is proposed for mining north of I-680. Existing permits and leases are proposed for mining south of I-680. San Antonio Creek is retained in this alternative.

There are five water storage pits in this alternative, one north and four south of I-680. Total water storage is 53,100 AF and total mining revenue is $55.4M.

Potential activities north of I-680 are limited due to the large size of the pit in this alternative. Potential activities north of I-680 include:

- Agriculture/Vineyard/Nursery/ Crops/ Aquaculture/Wetlands
- Landscaped Buffers, Setbacks and Mounds
- Interpretive Area - Water Temple, Archaeological Sites
- Picnic and Day Use Area and Parking
- Staging Area/Alameda Creek Enhancement/Wildlife Area

- Trail Connections to Niles Canyon/Pleasanton Ridge (EBRPD)

Non-body contact water-related recreation may or may not be considered in the future, following completion of mining. If considered, this activity would require subsequent environmental review.

Potential activities have also been identified for the area south of I-680. These activities are conceptual in nature and may or may not be executed in the future. Should any or all of these activities occur in the future, subsequent environmental review will be required. Potential activities south of I-680 include:
- Commercial Site
- Agriculture/Nursery
- Trail Connections to Sunol Regional Wilderness (EBRPD)
- Landscaped Buffers, Setbacks and Mounds

Potential activities have also been identified for the area south of the Hetch Hetchy Aqueduct. These activities are conceptual in nature and may or may not be executed in the future. Should any or all of these activities occur in the future, subsequent environmental review will be required. Potential activities south of the Hetch Hetchy Aqueduct include:
- Overnight Nature Study

Figure 8 illustrates Alternative E and includes a table identifying the usable storage and mining revenue generated by each pit. Table 1 provides a comparison between Alternative E and the other five alternatives. All figures and tables are included in Chapter 4 of this document. Alternative E, as well as Alternatives A and F, were studied in greater detail during the planning process, at the request of the SFPUC. These additional analyses are discussed in detail in Chapters 2.8 and 2.9.

3.7 Alternative F

Alternative F was prepared in response to Alternative E to comply with the extent of mining authorized under SMP-32. SMP-32 was permitted in 1995 by Alameda County after an extensive environmental review process. Alternative F provides mining both north and south of I-680 with all non-water storage related activities to be concessionaire developed and operated at no cost to the rate payer.

North of I-680 Alternative F accommodates all proposed mining from SMP-32. However, a 1/4 mile Resource Protection Setback from the Sunol Water Temple will be back filled following completion of mining. This setback is intended to provide an increased buffer between the Sunol Temple area and the quarry pit/reservoir. Quarrying and reclamation would be expedited in this area.

South of I-680 water storage is maximized. San Antonio Creek is retained as an important wildlife corridor.

Six water storage pits are proposed for this alternative, one north and five south of I-680. For comparative purposes, total water storage is 63,200 AF and total mining revenue is $67.7M.

Potential activities have been identified for the land and water areas north of I-680. Potential activities north of I-680 include:
- Agriculture/Vineyard/Nursery/Crops/Aquaculture/Wetlands
- Landscaped Buffers, Setbacks and Mounds
- Interpretive Area - Water Temple, Archaeological Sites
- Picnic and Bay Use Area and Parking

- Staging Area
- Alameda Creek Enhancement/Wildlife Area
- Trail Connections to Niles Canyon/Pleasanton Ridge (EBRPD)

A farmers market and non-body contact water-related recreation may or may not be considered in the future, following completion of mining. If considered, these activities would require subsequent environmental review.

Potential activities have also been identified for the area south of I-680. These activities are conceptual in nature and may or may not be executed in the future. Should any or all of these activities occur in the future, subsequent environmental review will be required. Potential activities south of I-680 include:
- Commercial Site
- Trail Connections to Sunol Regional Wilderness

Potential activities have also been identified for the area south of the Hetch Hetchy Aqueduct. These activities are conceptual in nature and may or may not be executed in the future. Should any or all of these activities occur in the future, subsequent environmental review will be required. Potential activities south of the Hetch Hetchy Aqueduct:
- Overnight Nature Study

Figure 9 illustrates Alternative F and includes a table identifying the usable storage and mining revenue generated by each pit. Table 1 provides a comparison between Alternative F and the other five alternatives. All figures and tables are included in Chapter 4 of this document. Alternative F, as well as Alternatives A and E, were studied in greater detail during the planning process, at the request of the SFPUC. These additional analyses are discussed in detail in Chapters 3.8 and 3.9.

3.8 Comparison Between Alternatives A, E and F

As part of the planning process, the SFPUC requested additional information on Alternatives A, E and F at the March 26, 1996 SFPUC meeting. This information was presented at the April 9, 1996 SFPUC meeting. Information requested included more detailed information on pit configuration, leasing and phasing, comparative cumulative gross mining revenue, and comparative cumulative usable water storage. A summary and comparison of cost assumptions was also requested. As this study is intended to be at a conceptual level, all numbers and information prepared for this analysis are for comparative purposes only.

Pit Configuration, Leasing and Phasing

This analysis identified pits both east and west of Alameda Creek. The prior analyses of the six alternatives addressed only the pits east of Alameda Creek. Following a review of all of the existing leases and permits, the following was identified for each alternative:
- pits requiring additional lease negotiation
- pits requiring additional permit negotiation
- pits requiring additional lease and permit negotiation
- pits requiring no additional negotiation
- pits with silt deposits

Figures 10 through 12 illustrate the pit configuration and the lease and/or permit status of each pit under Alternatives A, E and F. These figures are included in Chapter 4 of this document.

Comparative Cumulative Gross Mining Revenue
Comparative Cumulative Usable Water Storage

Based upon assumptions made above regarding phasing of the storage pits, cumulative gross mining revenue and cumulative usable water storage were identified. The Cumulative Gross Mining Revenue diagrams, included on Figures 10, 11 and 12 for Alternatives A, E and F, illustrate the estimated gross revenue to the SFPUC from mining the pits east of Alameda Creek. Although the revenue stream to the SFPUC is relatively constant, a cumulative revenue number is indicated for the years in which mining is completed in a certain pit. The Cumulative Usable Water Storage diagrams, also included on Figures 10 through 12, illustrate the amount of storage due to come on line in a given year. The year is estimated to come on line based upon phasing assumptions. A table identifying the Timing of Usable Water Storage is also included on Figures 10 through 12 as are tables indicating the phasing, revenue generation and water storage of each lessee's pits. Assumptions are also included for each alternative.

3.9 North of I-680: Pit E1 Restored to Pit F1

At the April 9, 1996 SFPUC meeting, the SFPUC requested information on the creation of a hybrid alternative in which mining North of I-680 would proceed according to Alternative E and, following completion of mining, the quarry would be reclaimed to the configuration of Alternative F. This reclaimed land would provide for maximum mining and revenue and the reclaiming of the pit to Alternative F would reinstate the ¼ mile buffer around the Sunol Temple. South of I-680, mining would following the strategies set forth for Alternative F. Figure 13 illustrates the phasing of mining for the areas both north and south of I-680 under this scenario. Figures 13 is included in Chapter 4 of this document.

CHAPTER 4: FIGURES AND TABLES

This chapter contains the figures and tables referred to in the previous chapters. The figures and tables are in the following order:

Figure 1: Sunol Valley Location Map
Figure 2: Existing Conditions
Figure 3: Sunol Valley Mining Permits and Leases
Figure 4: Sunol Valley Resources Management Element: Alternative A
Figure 5: Sunol Valley Resources Management Element: Alternative B
Figure 6: Sunol Valley Resources Management Element: Alternative C
Figure 7: Sunol Valley Resources Management Element: Alternative D
Figure 8: Sunol Valley Resources Management Element: Alternative E
Figure 9: Sunol Valley Resources Management Element: Alternative F
Figure 10: Comparative Gross Mining Revenue and Usable Water Storage: Alternative A
Figure 11: Comparative Gross Mining Revenue and Usable Water Storage: Alternative E
Figure 12: Comparative Gross Mining Revenue and Usable Water Storage: Alternative F
Figure 13: Sunol Valley Phasing Diagram: Mining and Water Storage North of I-680: Pit E1 Restored to Pit F1/South of I-680: Alternative F

Table 1: Comparison Between Alternatives

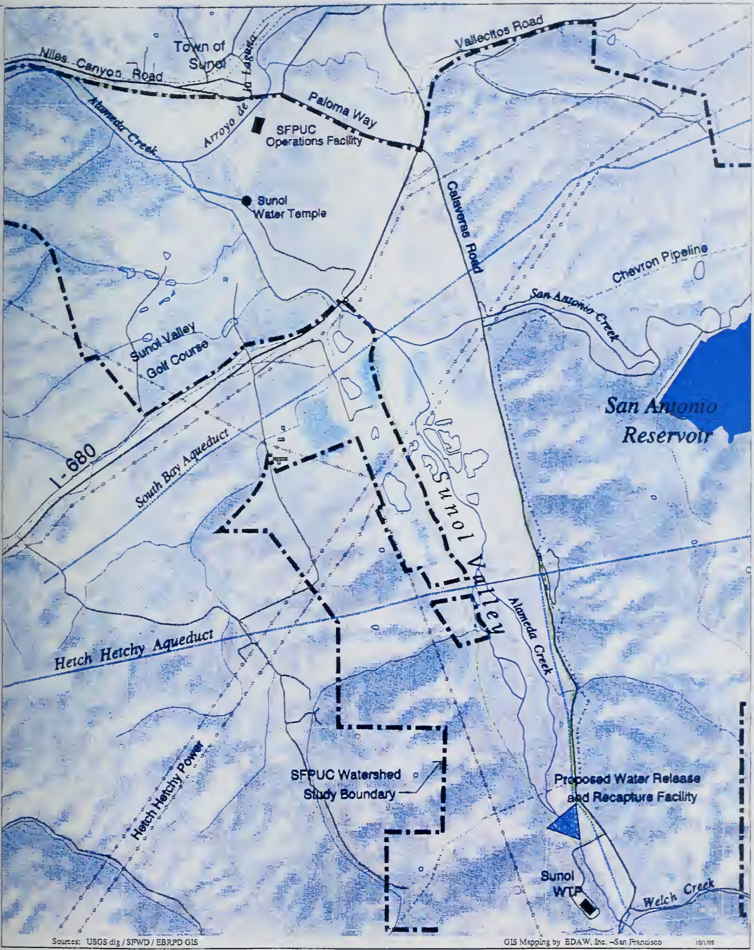


Figure 1 Sunol Valley

Scale 1 : 31,680
1" = 0.5 mile

Feet 1000 0 1000 2000 3000

Meters 500 0 500 1000

N

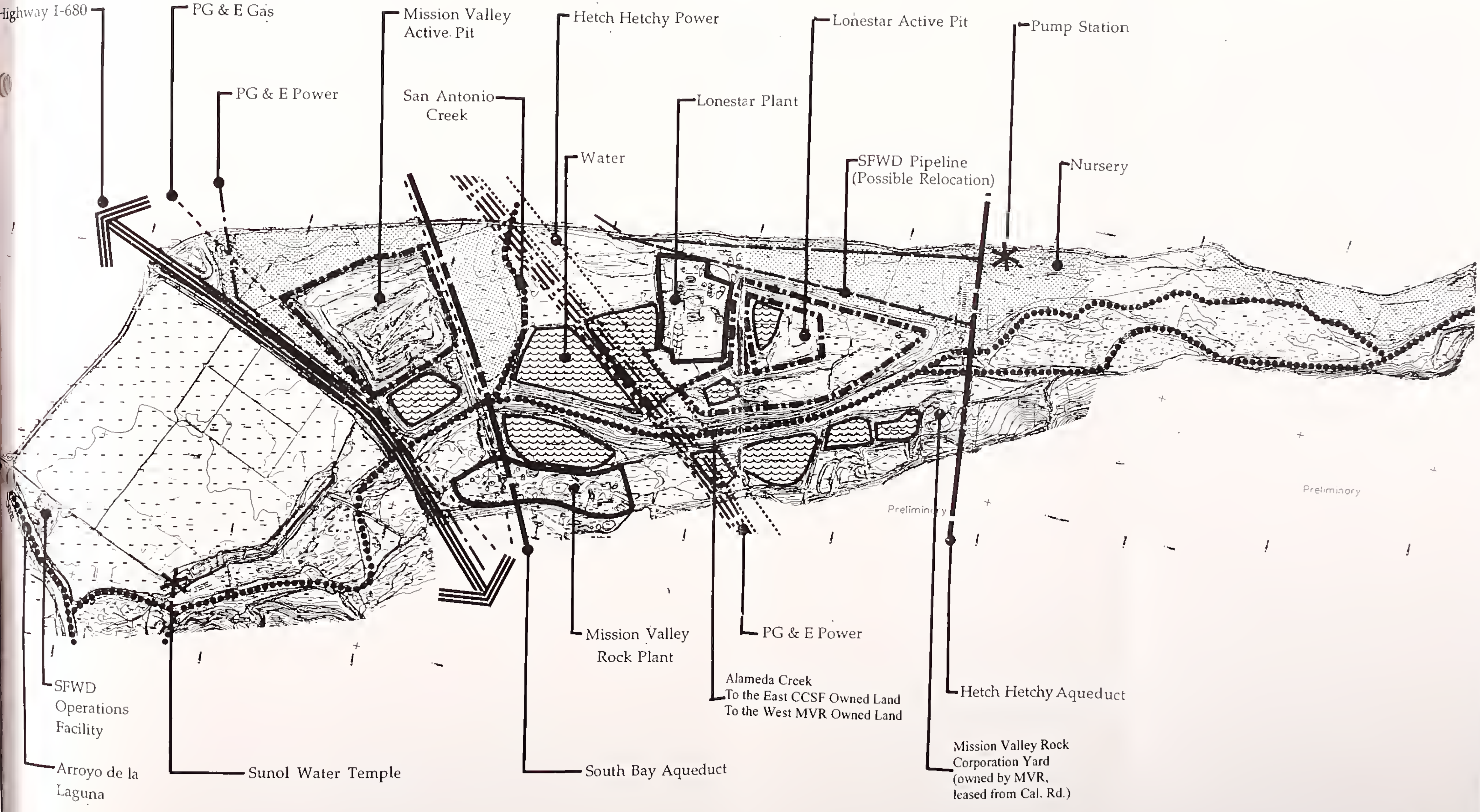
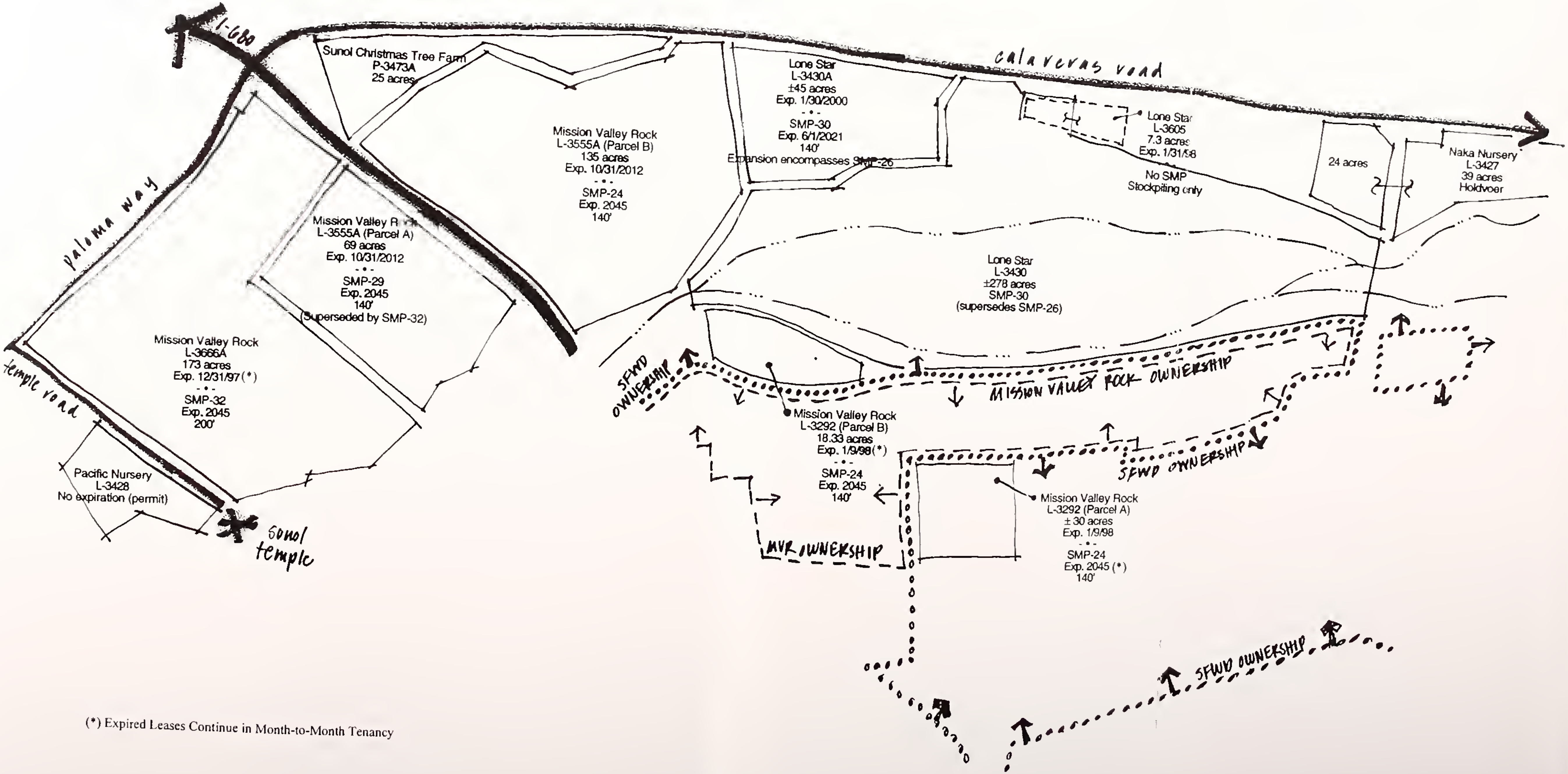
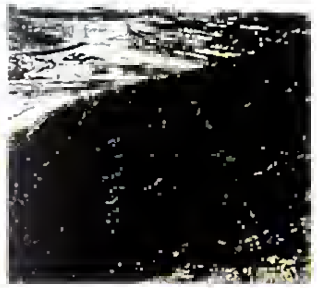


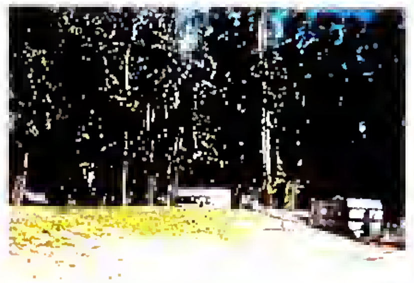
FIGURE 2: EXISTING CONDITIONS

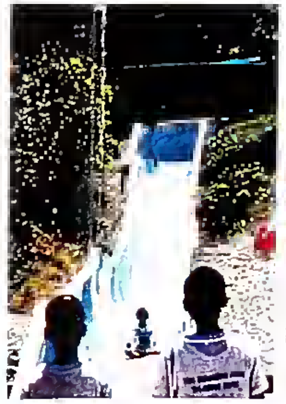


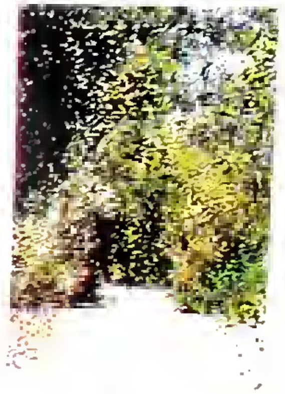
(*) Expired Leases Continue in Month-to-Month Tenancy

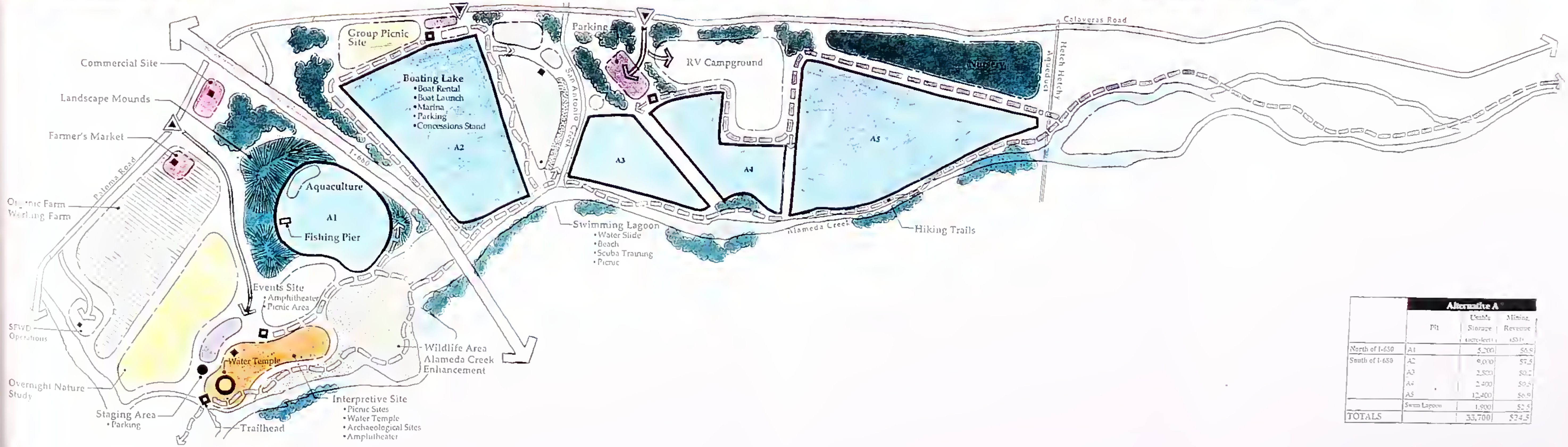
FIGURE 3: SUNOL VALLEY MINING PERMITS AND LEASES











	Alternative A		
	Pit	Usable Storage (acre-feet)	Mining Revenue ($M)
North of I-680	A1	5,200	$6.5
South of I-680	A2	9,000	$7.5
	A3	2,500	$0.2
	A4	2,400	$0.5
	A5	12,400	$6.9
	Swim Lagoon	1,900	$2.5
TOTALS		33,700	$24.5

Key Points

- Mining of Existing Permits and Leases
- Mining South and North of I-680
- Recreation Activities Developed to Generate Revenue
- Five Water Storage Pits
  - One North of I-680
  - Four South of I-680
- Total Water Storage Volume
  - Mined to 200' - 33,700 AF

Activities North of I-680

- Commercial Site - Gas/Groceries
- Farmers Market
- Organic Farm/Working Farm
- Overnight Nature Study
- Fishing Area/Aquaculture
- Landscaped Mounds
- Interpretive Area/Events Site - Water Temple, Archaeological Sites, Amphitheater, Picnic Area, Events Building
- Parking
- Staging Area
- Alameda Creek Enhancement/Wildlife Area
- Trail Connections to Niles Canyon/Pleasanton Ridge (EBRPD)

Activities South of I-680

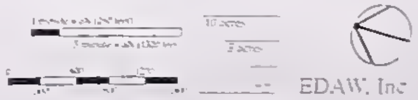
- Group Picnic Area
- Boating Facility - Marina, Boat Launch, Boat Rental, Concessionaire
- Swimming Lagoon - Beach, Water Slide, Scuba Training, Picnic Area, Concessionaire
- RV Campground
- Trail Connections to Sunol Regional Wilderness (EBRPD)

Location Map

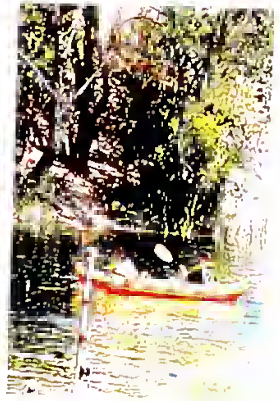
FIGURE 4: ALTERNATIVE A

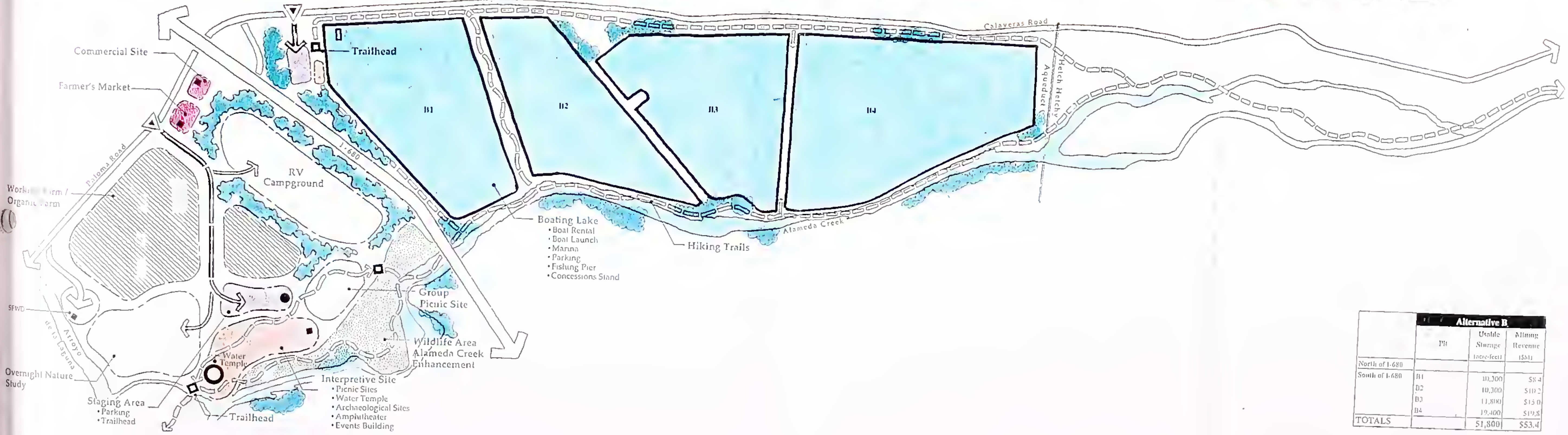
San Francisco Water Department • San Francisco Watershed Management Plans

Sunol Valley Resources Management Element • Alternative A



EDAW, Inc





	Alternative B		
	Pit	Usable Storage (acre-feet)	Mining Revenue ($M)
North of I-680			
South of I-680	B1	10,300	$8.4
	B2	10,300	$10.2
	B3	11,800	$15.0
	B4	19,400	$19.8
TOTALS		51,800	$53.4

Key Points

- Water Storage Maximized South of I-680
- Mining South of I-680 Only
- San Antonio Creek Removed to Maximize Storage
- Recreation Activities Developed to Generate Revenue
- Four Water Storage Pits
  - All South of I-680
- Total Water Storage Volume
  - Mined to 200' - 51,800 AF

Activities North of I-680

- Commercial Site - Gas/Groceries
- Farmers Market
- RV Campground
- Organic Farm/Working Farm
- Overnight Nature Study
- Interpretive Area/Events Site - Water Temple, Archaelogical Sites, Amphitheater, Picnic Area, Events Building
- Parking
- Staging Area
- Group Picnic Area
- Alameda Creek Enhancement/Wildlife Area
- Trail Connections to Niles Canyon/Pleasanton Ridge (EBRPD)

Activities South of I-680

- Boating Facility - Marina, Boat Launch, Boat Rental, Concessionaire
- Fishing Area - Shoreline Fishing, Fishing Pier
- Trail Connections to Sunol Regional Wilderness (EBRPD)

Location Map

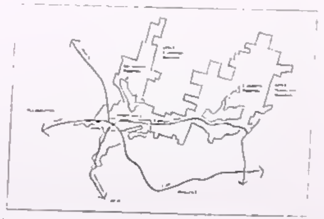
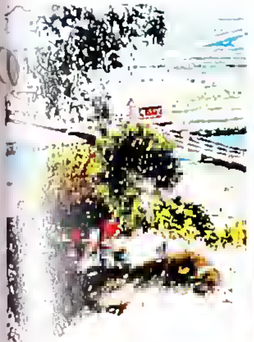


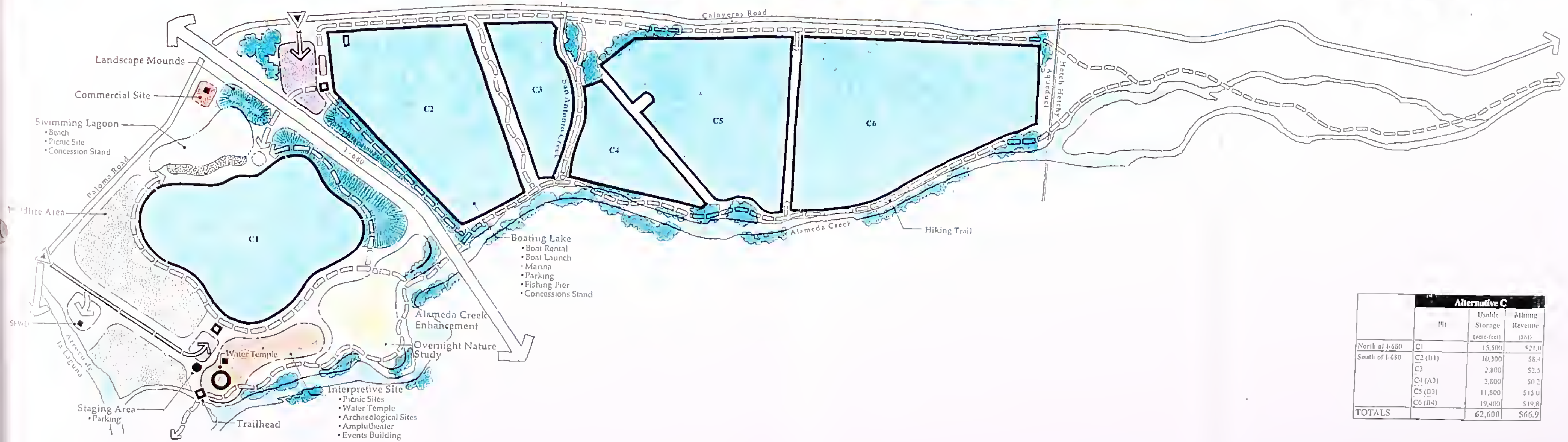
FIGURE 5: ALTERNATIVE B

San Francisco Water Department • San Francisco Watershed Management Plans

Sunol Valley Resources Management Element • Alternative B

EDAW, Inc.





	Alternative C		
	Pit	Usable Storage (acre-feet)	Mining Revenue ($M)
North of I-680	C1	15,500	$21.0
South of I-680	C2 (B1)	10,300	$8.4
	C3	2,800	$2.5
	C4 (A3)	2,800	$0.2
	C5 (B3)	11,800	$15.0
	C6 (B4)	19,400	$19.8
TOTALS		62,600	$66.9

Key Points

- Water Storage Maximized North and South of I-680
- Mining North and South of I-680
- Maximize Quarrying South of I-680 Prior to Mining North of I-680
- Retain San Antonio Creek
- Limited Recreation Activities
- Six Water Storage Pits
  - One North of I-680, Five South of I-680
- Total Water Storage Volume
  - Mined to 200' - 62,600 AF

Activities North of I-680

- Commercial Site - Gas/Groceries
- Swimming Lagoon - Beach, Picnic Site, Concession
- Landscaped Mounds and Buffers
- Wildlife Area
- Interpretive Area/Events Site - Water Temple, Archaelogical Sites, Amphitheater, Picnic Area, Events Building
- Overnight Nature Study
- Staging Area
- Alameda Creek Enhancement
- Trail Connections to Niles Canyon/Pleasanton Ridge (EBRPD)

Activities South of I-680

- Parking
- Boating Facility - Marina, Boat Launch, Boat Rental, Concession
- Trail Connections to Sunol Regional Wilderness (EBRPD)

Location Map

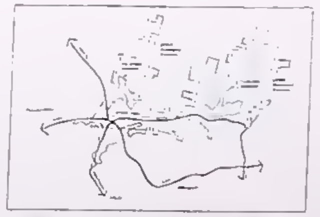
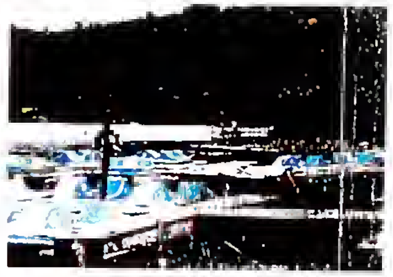
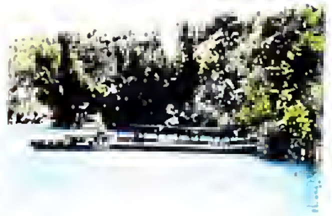
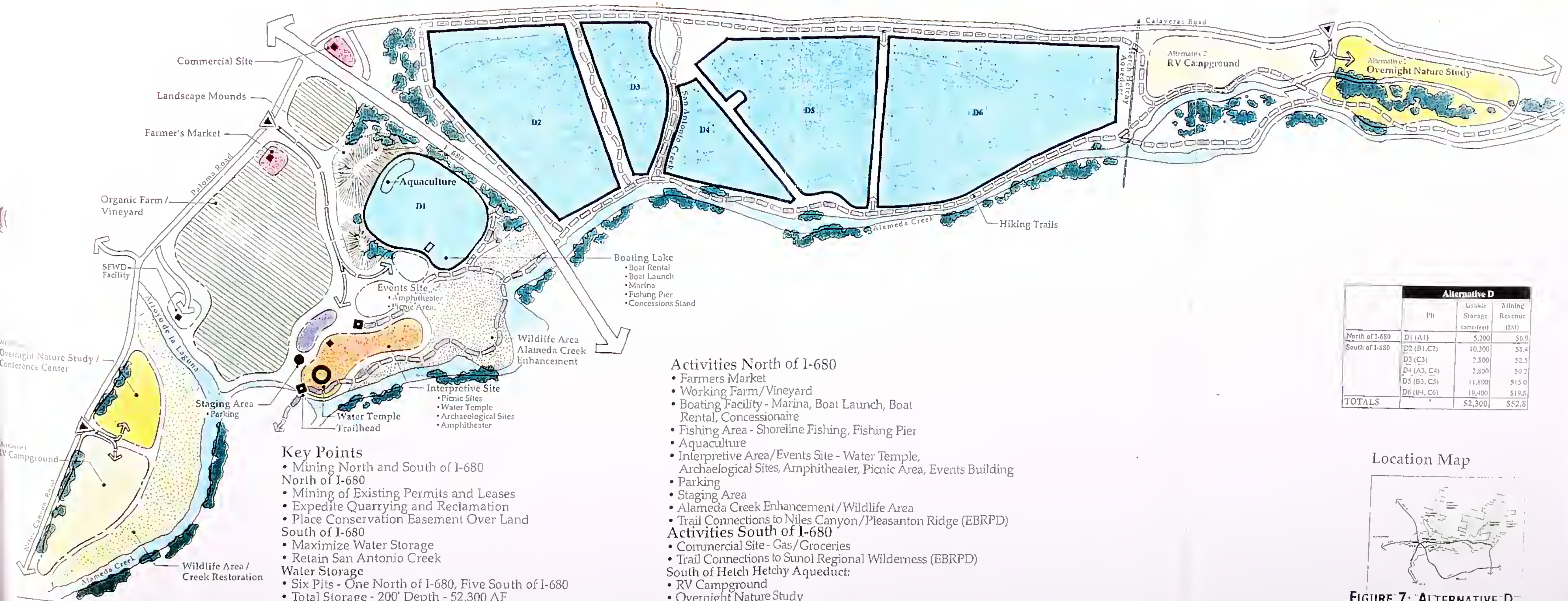


FIGURE 6: ALTERNATIVE C

EDAW, Inc.







Key Points

- Mining North and South of I-680

North of I-680
- Mining of Existing Permits and Leases
- Expedite Quarrying and Reclamation
- Place Conservation Easement Over Land

South of I-680
- Maximize Water Storage
- Retain San Antonio Creek

Water Storage
- Six Pits - One North of I-680, Five South of I-680
- Total Storage - 200' Depth - 52,300 AF

Activities North of I-680

- Farmers Market
- Working Farm/Vineyard
- Boating Facility - Marina, Boat Launch, Boat Rental, Concessionaire
- Fishing Area - Shoreline Fishing, Fishing Pier
- Aquaculture
- Interpretive Area/Events Site - Water Temple, Archaeological Sites, Amphitheater, Picnic Area, Events Building
- Parking
- Staging Area
- Alameda Creek Enhancement/Wildlife Area
- Trail Connections to Niles Canyon/Pleasanton Ridge (EBRPD)

Activities South of I-680

- Commercial Site - Gas/Groceries
- Trail Connections to Sunol Regional Wilderness (EBRPD)

South of Hetch Hetchy Aqueduct:
- RV Campground
- Overnight Nature Study

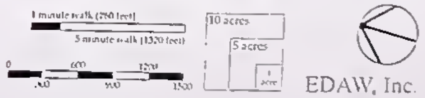
	Alternative D		
	Pit	Usable Storage (acre-feet)	Mining Revenue ($M)
North of I-680	D1 (A1)	5,200	$6.9
South of I-680	D2 (B1, C2)	10,300	$8.4
	D3 (C3)	2,800	$2.5
	D4 (A3, C4)	2,800	$0.2
	D5 (B3, C5)	11,800	$15.0
	D6 (B4, C6)	19,400	$19.8
TOTALS		52,300	$52.8

Location Map

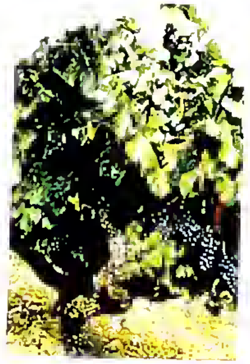
FIGURE 7: ALTERNATIVE D

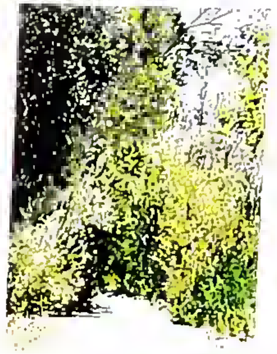
San Francisco Water Department • San Francisco Watershed Management Plans

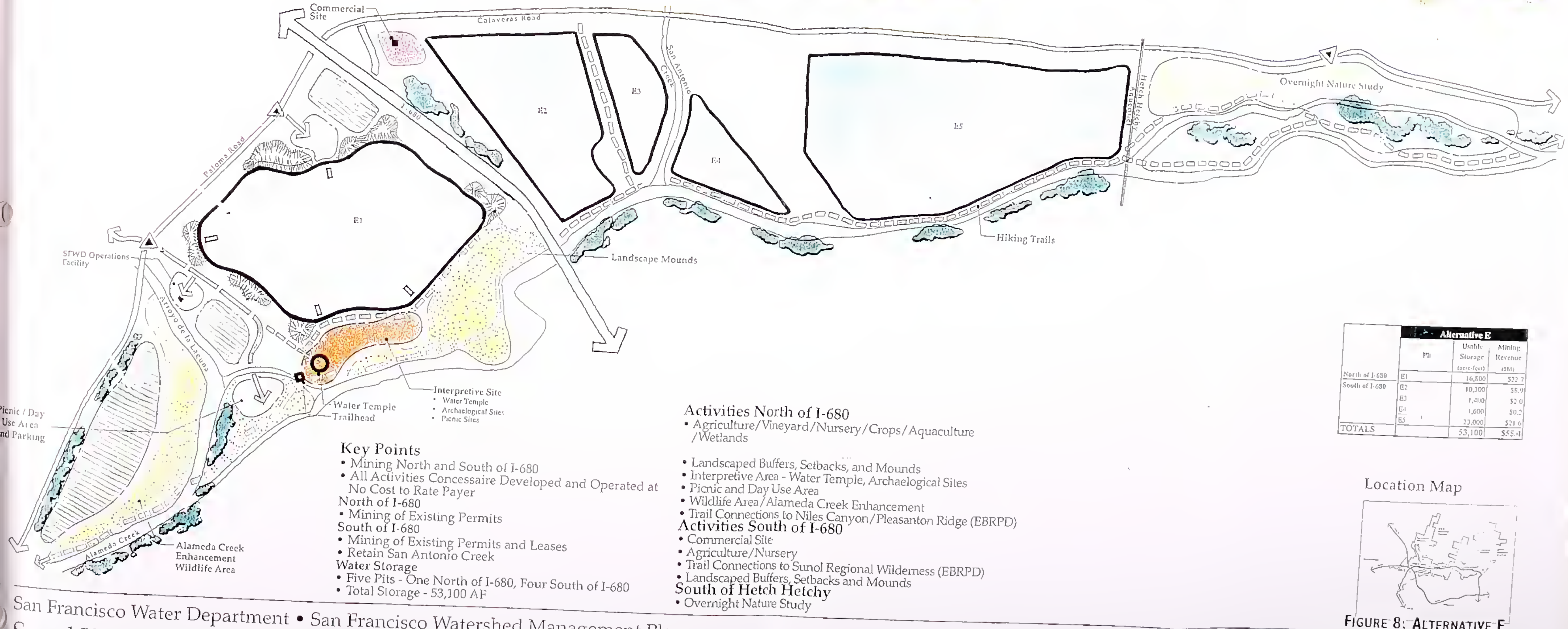
Sunol Valley Resources Management Element • Alternative D



EDAW, Inc.







Key Points

- Mining North and South of I-680
- All Activities Concessaire Developed and Operated at No Cost to Rate Payer

North of I-680

- Mining of Existing Permits

South of I-680

- Mining of Existing Permits and Leases
- Retain San Antonio Creek

Water Storage

- Five Pits - One North of I-680, Four South of I-680
- Total Storage - 53,100 AF

Activities North of I-680

- Agriculture/Vineyard/Nursery/Crops/Aquaculture /Wetlands
- Landscaped Buffers, Setbacks, and Mounds
- Interpretive Area - Water Temple, Archaeological Sites
- Picnic and Day Use Area
- Wildlife Area/Alameda Creek Enhancement
- Trail Connections to Niles Canyon/Pleasanton Ridge (EBRPD)

Activities South of I-680

- Commercial Site
- Agriculture/Nursery
- Trail Connections to Sunol Regional Wilderness (EBRPD)
- Landscaped Buffers, Setbacks and Mounds

South of Hetch Hetchy

- Overnight Nature Study

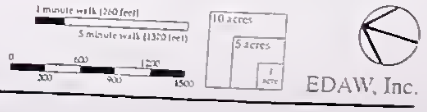
	Alternative E		
	Pit	Usable Storage (acre-feet)	Mining Revenue ($M)
North of I-680	E1	16,800	$22.7
South of I-680	E2	10,300	$8.9
	E3	1,400	$2.0
	E4	1,600	$0.2
	E5	23,000	$21.6
TOTALS		53,100	$55.4

Location Map

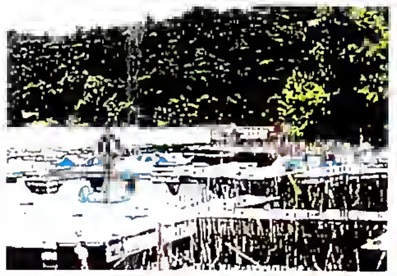
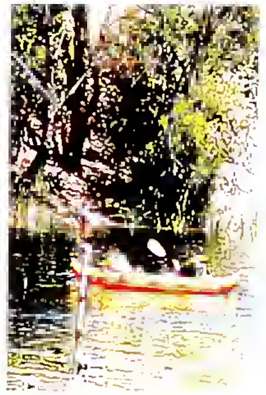
FIGURE 8: ALTERNATIVE E

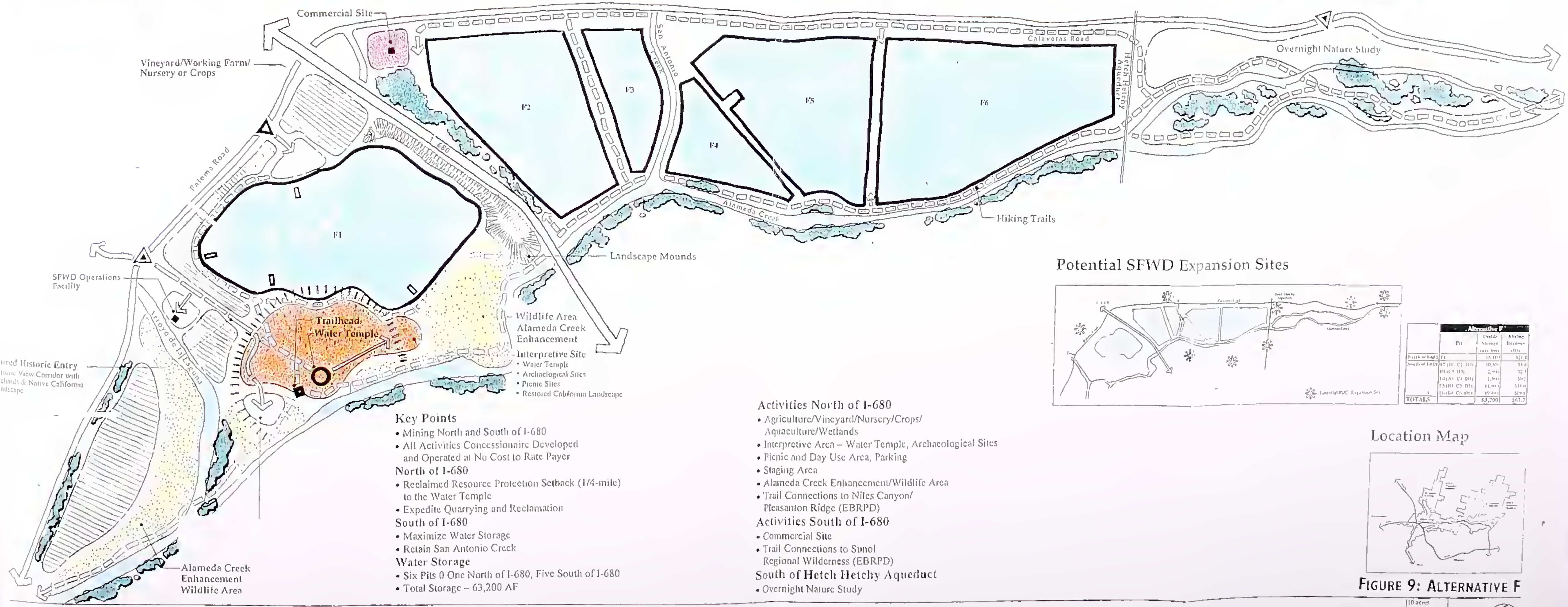
San Francisco Water Department • San Francisco Watershed Management Plans

Sunol Valley Resources Management Element • Alternative E (Preferred Mining Alternative North of I-680)



EDAW, Inc.



Key Points
- Mining North and South of I-680
- All Activities Concessionaire Developed and Operated at No Cost to Rate Payer

North of I-680
- Reclaimed Resource Protection Setback (1/4-mile) to the Water Temple
- Expedite Quarrying and Reclamation

South of I-680
- Maximize Water Storage
- Retain San Antonio Creek

Water Storage
- Six Pits 0 One North of I-680, Five South of I-680
- Total Storage – 63,200 AF

Activities North of I-680
- Agriculture/Vineyard/Nursery/Crops/ Aquaculture/Wetlands
- Interpretive Area – Water Temple, Archaeological Sites
- Picnic and Day Use Area, Parking
- Staging Area
- Alameda Creek Enhancement/Wildlife Area
- Trail Connections to Niles Canyon/ Pleasanton Ridge (EBRPD)

Activities South of I-680
- Commercial Site
- Trail Connections to Sunol Regional Wilderness (EBRPD)

South of Hetch Hetchy Aqueduct
- Overnight Nature Study

Potential SFWD Expansion Sites

	Alternative F		
	Pit	Usable Storage (acre-feet)	Mining Revenue ($M)
North of I-680	F1	[illegible]	[illegible]
South of I-680	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]
TOTALS		63,200	$67.2

Location Map

FIGURE 9: ALTERNATIVE F

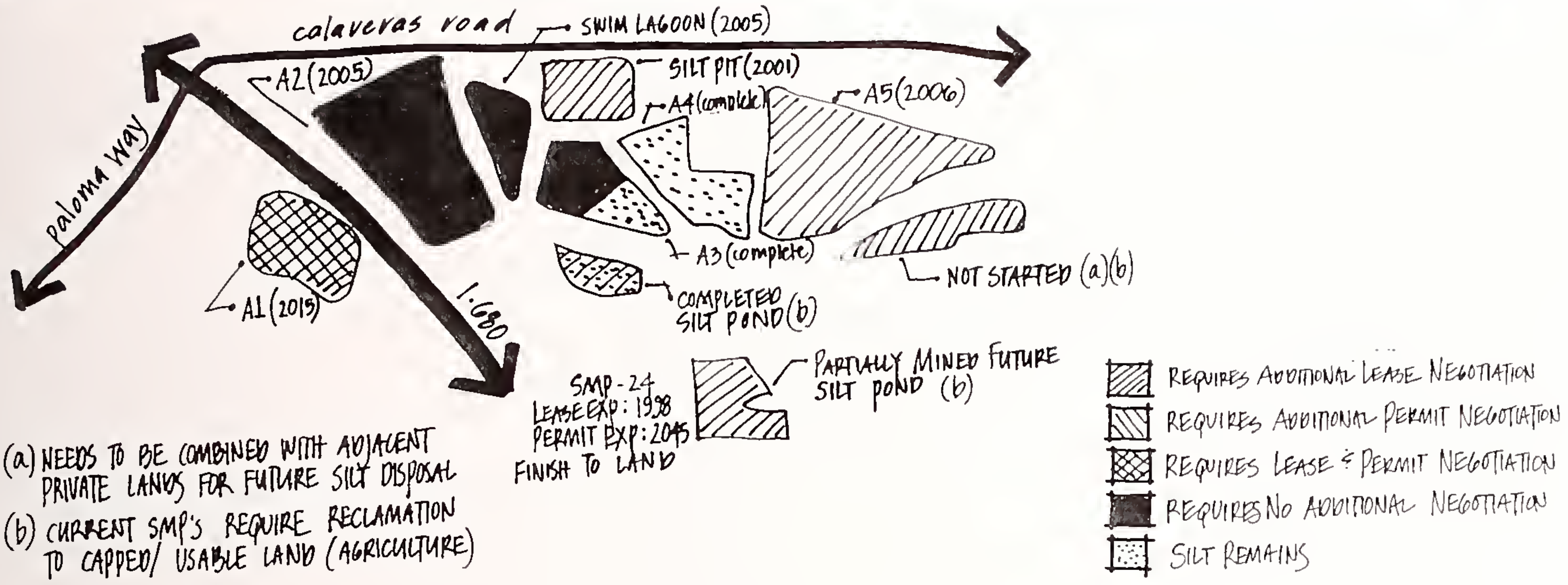
San Francisco Water Department • San Francisco Watershed Management Plans

Sunol Valley Resources Management Element • Alternative F

EDAW, Inc.

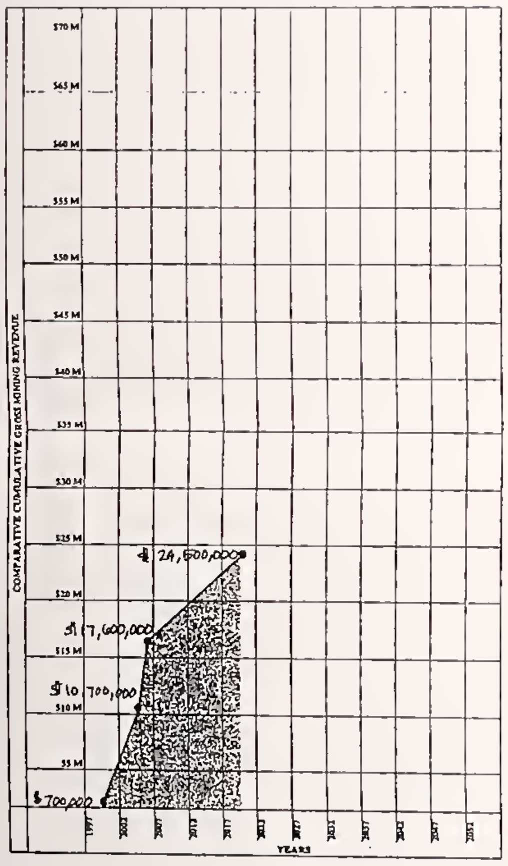
COMPARATIVE GROSS MINING REVENUE AND USABLE WATER STORAGE TABLES - ALTERNATIVES A, E AND F

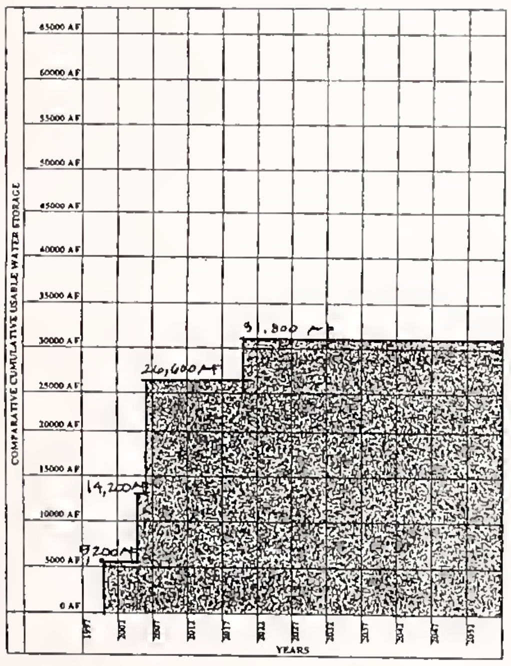
ALTERNATIVE A



(a) NEEDS TO BE COMBINED WITH ADJACENT PRIVATE LANDS FOR FUTURE SILT DISPOSAL

(b) CURRENT SMP'S REQUIRE RECLAMATION TO CAPPED/ USABLE LAND (AGRICULTURE)





Timing of Usable Water Storage

Year	Pit(s)	Total Storage	Total Revenue
±2000	A3, A4	5,200	$700,000
2005	A2, Swim Lagoon	14,200	$10,700,000
2006	A5	26,600	$17,600,000
2015 - 2020	A1	31,800	$24,500,000

Lessee	Mission Valley Rock			Lone Star				Totals
Pit Number	A2	Swim Lagoon	A1	A3 (f)	A4 (g)	Silt Pit (h)	A5	
Estimated Mining Completion (a)	2005 (b)	2005 (b)	2015 - 2020	Complete (b)	Complete (b)	2001 (b)	2006 (b)	
Lease Expires	2012	2012	2012	-	-	2000	2000	
Permit Expires	2045 (b)	2045 (b)	2045	-	-	2021 (b)	2021 (b)	
Usable Storage at Completion (AF) (d)	9,000	0	5,200	2,800	2,400	0	12,400	31,800
Revenue At Completion (e)	$7,500,000	$2,500,000	$6,900,000	$200,000	$500,000	$3,100,000	$6,900,000	$24,500,000 (c)

Numbers in this table are for comparative purposes only.

(a) Estimates based upon conversations with Mort Calvert, Mission Valley Rock 3/29/96. Timing based upon mining to 140'.

(b) Storage and revenues reflect mining to 200'.

(c) Total does not include silt pit which provides $3,100,000 additional revenue (total revenue: $27,600,000) but no additional storage

(d) Total does not include Swimming Lagoon storage

(e) Assumes mining rates of 1.2 M tons/year (Mission Valley Rock) and 1 M tons/Year (Lone Star); and revenue per ton of $0.60. Annual MVR revenue is $720,000 and annual LS revenue is $600,000 at these rates and revenue.

(f) Pit partially silted and silting is in progress

(g) Totally silted

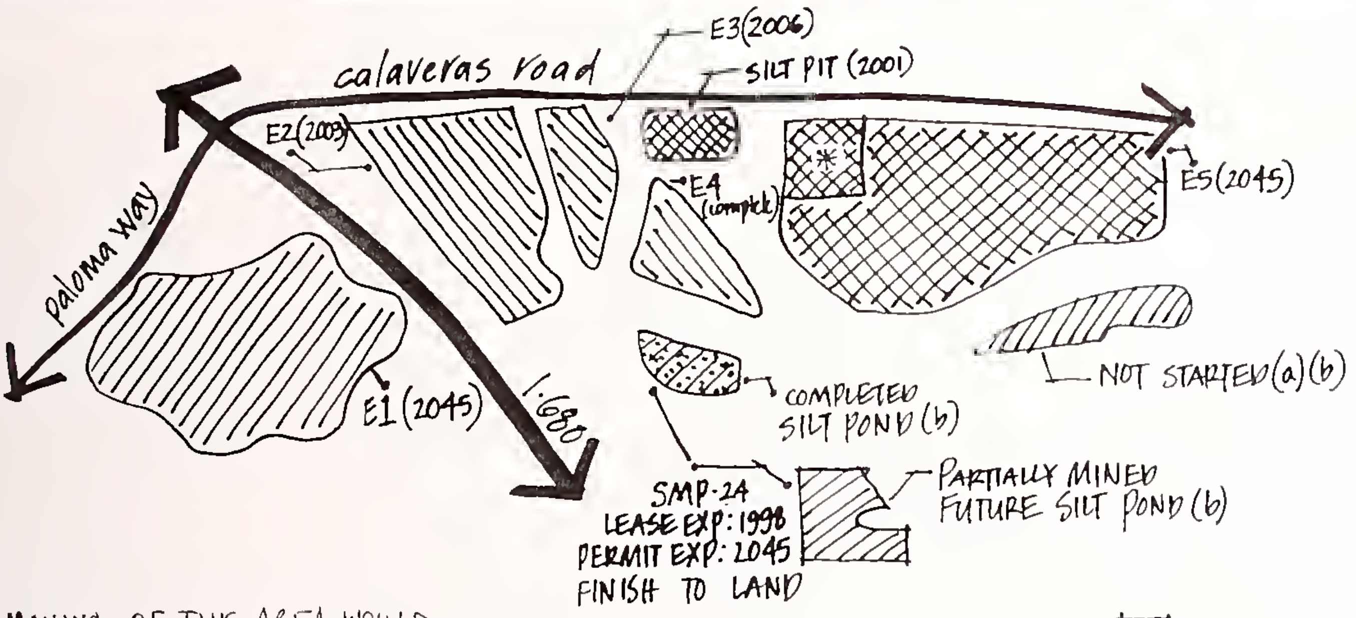
(h) Current SMP require reclamation to capped and usable land use (agriculture)

Notes:

Scenario assumes two operators.

COMPARATIVE GROSS MINING REVENUE AND USABLE WATER STORAGE TABLES - ALTERNATIVES A, E AND F

ALTERNATIVE E

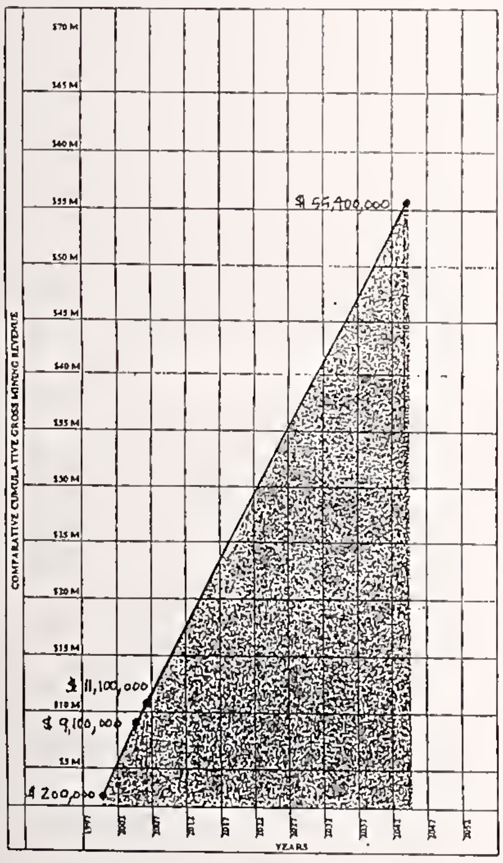


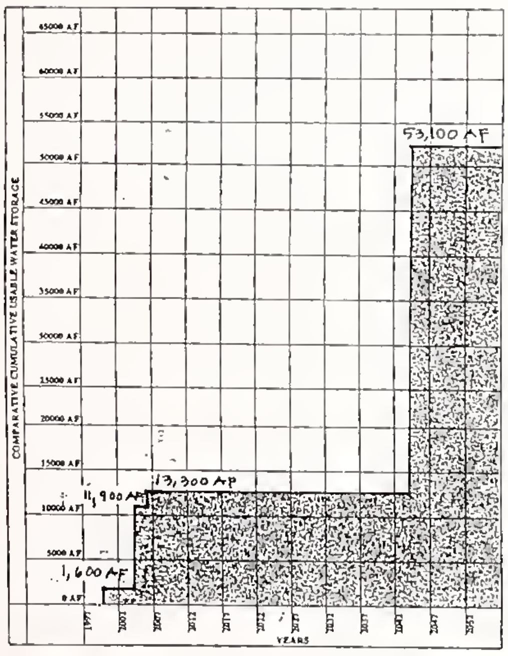
* MINING OF THIS AREA WOULD REQUIRE RELOCATION OF THE EXISTING PLANT TO AN UNDETERMINED LOCATION.

(a) NEEDS TO BE COMBINED WITH ADJACENT PRIVATE LANDS FOR FUTURE SILT DISPOSAL

(b) CURRENT SMP'S REQUIRE RECLAMATION TO CAPPED/USABLE LAND (AGRICULTURE)

- ▨ REQUIRES ADDITIONAL LEASE NEGOTIATION
- ▧ REQUIRES ADDITIONAL PERMIT NEGOTIATION
- ▩ REQUIRES LEASE & PERMIT NEGOTIATION
- ■ REQUIRES NO ADDITIONAL NEGOTIATION
- ▒ SILT REMAINS





Timing of Usable Water Storage

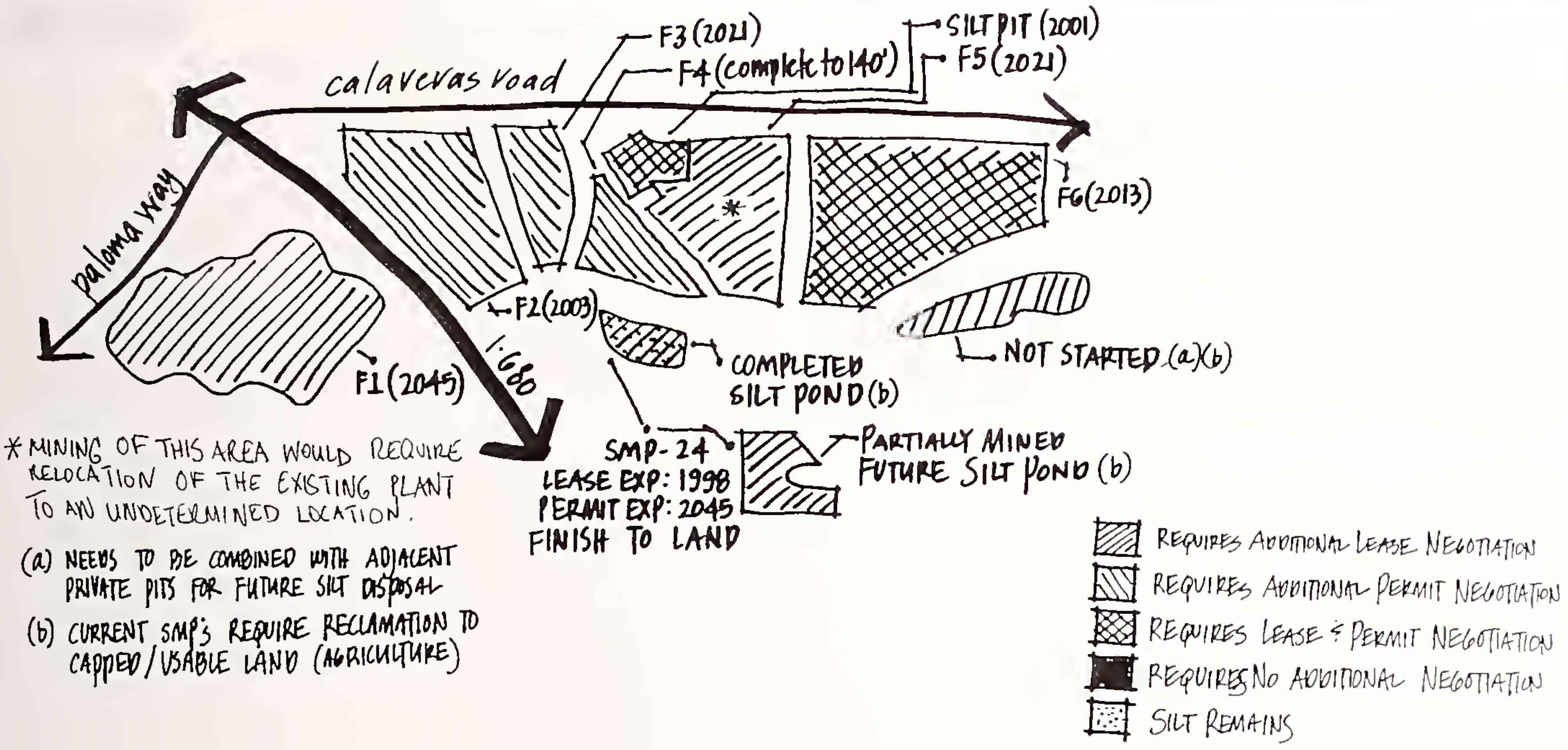
Year	Pit(s)	Total Storage	Total Revenue
±2000	E4	1,600	$200,000
2003	E2	11,900	$9,100,000
2006	E3	13,300	$11,100,000
2045	E1, E5	53,100	$55,400,000

Lessee	Mission Valley Rock			Lone Star			Totals
Pit Number	E2	E3	E1	E4 (f)	Silt Pit (g)	E5	
Estimated Mining Completion (a)	2003 (b)	2006 (b)	2045	Complete (b)	2001 (b)	2045 (b)	
Lease Expires	2012	2012	No Lease	-	2000	2000	
Permit Expires	2045 (b)	2045 (b)	2045	-	2021 (b)	2021 (b)	
Usable Storage at Completion (AF) (d)	10,300	1,400	16,800	1,600	0	23,000	53,100
Revenue At Completion (e)	$8,900,000	$2,000,000	$22,700,000	$200,000	$3,100,000	$21,600,000	$55,400,000 (c)

Numbers in this table are for comparative purposes only.
(a) Estimates based upon conversations with Mort Calvert, Mission Valley Rock 3/29/96
(b) Mining completion date based upon mining to 200' which requires an amendment to existing permits.
Current permitted depth is 140' on all permits except SMP-32 (Pit E1).
(c) Total does not include silt pit which provides $3,100,000 additional revenue (total revenue: $58,500,000) but no additional storage
(d) Total does not include Swimming Lagoon storage
(e) Assumes mining rates of 1.2 M tons/year (Mission Valley Rock) and 1 M tons/Year (Lone Star); and revenue per ton of $0.60.
Annual MVR revenue is $720,000 and annual LS revenue is $600,000 at these rates and revenue.
(f) Pit partially silted and silting is in progress
(g) Current SMP require reclamation to capped and usable land use (agriculture)
Notes:
Scenario assumes two operators.

COMPARATIVE GROSS MINING REVENUE AND USABLE WATER STORAGE TABLES - ALTERNATIVES A, E AND F

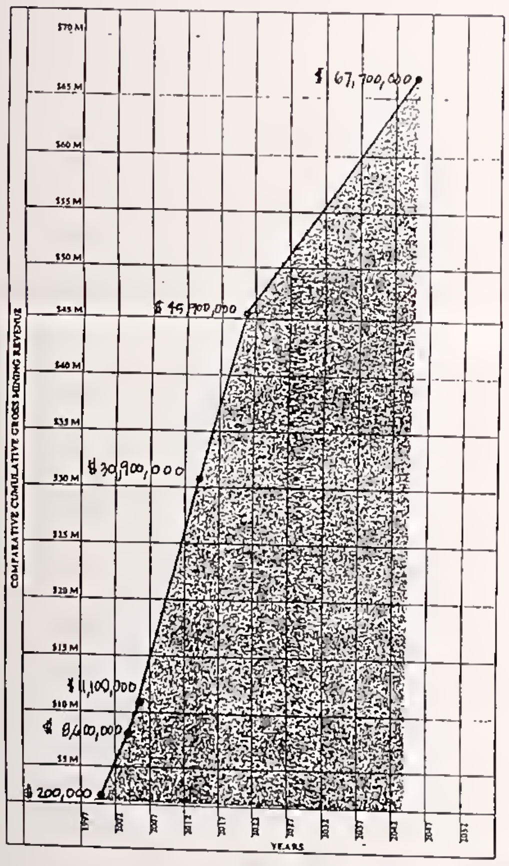
ALTERNATIVE F

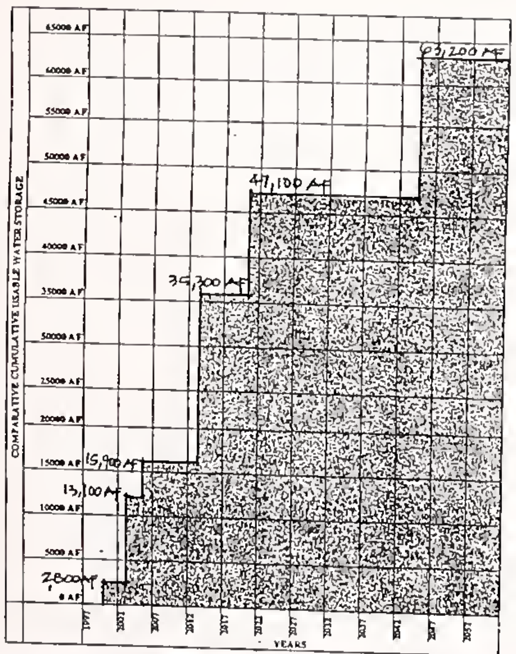


* MINING OF THIS AREA WOULD REQUIRE RELOCATION OF THE EXISTING PLANT TO AN UNDETERMINED LOCATION.

(a) NEEDS TO BE COMBINED WITH ADJACENT PRIVATE PITS FOR FUTURE SILT DISPOSAL

(b) CURRENT SMP'S REQUIRE RECLAMATION TO CAPPED/USABLE LAND (AGRICULTURE)





Timing of Usable Water Storage

Year	Pit(s)	Total Storage	Total Revenue
±2000	F4	2,800	$200.000
2003	F2	13.100	$8,600.000
2006	F3	15.900	$11.100,000
2013	F6	35,300	$30,900,000
2021	F5	47,100	$45,900.000
2045	F1	63.200	$67,700,000

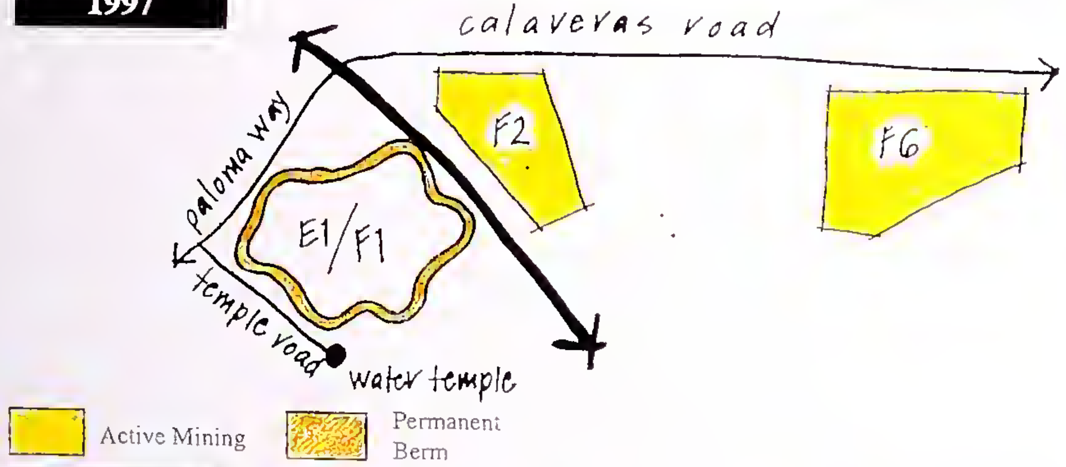
Lessee	Mission Valley Rock			Lone Star		Lone Star		Totals
Pit Number	F2	F3	F1	F4 (f)	Silt Pit (g)	F6	F5	
Estimated Mining Completion (a)	2003 (b)	2006 (b)	2045	Complete (b)	2001 (b)	2013 (b)	2021 (b)	
Lease Expires	2012	2012	No Lease	-	2000	2000	2000	
Permit Expires	2045 (b)	2045 (b)	2045	-	2021 (b)	2021 (b)	2021 (b)	
Usable Storage at Completion (AF) (d)	10,300	2,800	16,100	2,800	0	19,400	11,800	63,200
Revenue At Completion (e)	$8,400,000	$2,500,000	$21,800,000	$200,000	$200,000	$19,800,000	$15,000,000	$67,700,000 (c)

Numbers In this table are for comparative purposes only.
(a) Estimates based upon conversations with Mort Calvert, Mission Valley Rock 3/29/96
(b) Mining completion date based upon mining to 200' which requires an amendment to existing permits.
Current permitted depth is 140' on all permits except SMP-32 (Pit E1).
(c) Total does not include silt pit which provides $3,100,000 additional revenue (total revenue: $70,800,000) but no additional storage
(d) Total does not include Swimming Lagoon storage
(e) Assumes mining rates of 1.2 M tons/year (Mission Valley Rock) and 1 M tons/Year (Lone Star); and revenue per ton of $0.60.
Annual MVR revenue is $720,000 and annual LS revenue is $600,000 at these rates and revenue.
(f) Pit partially silted and silting is in progress
(g) Current SMP require reclamation to capped and usable land use (agriculture)
Notes:
Scenario assumes two operators.

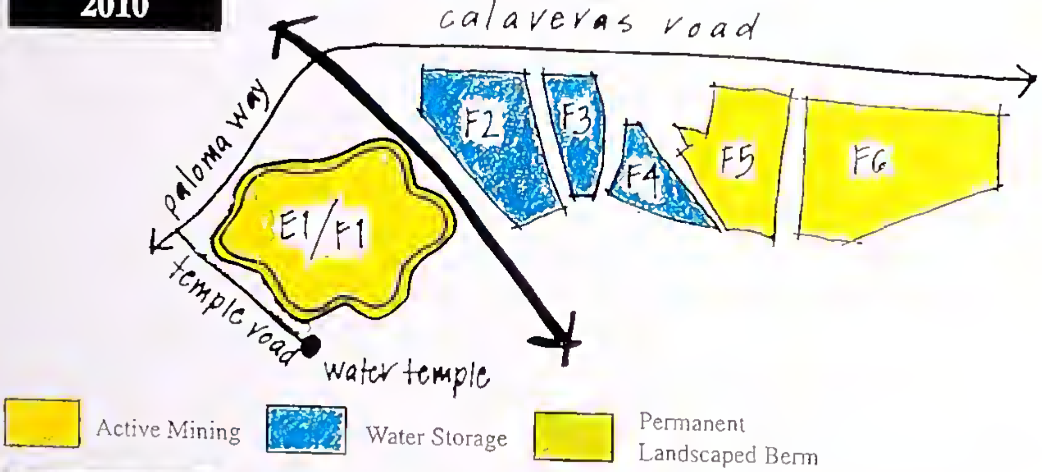
FIGURE 12

SUNOL VALLEY RESOURCES MANAGEMENT PLAN
SUNOL VALLEY PHASING DIAGRAM: MINING AND WATER STORAGE
NORTH OF I-680: PIT E1 RESTORED TO PIT F1 / SOUTH OF I-680: ALTERNATIVE F

1997



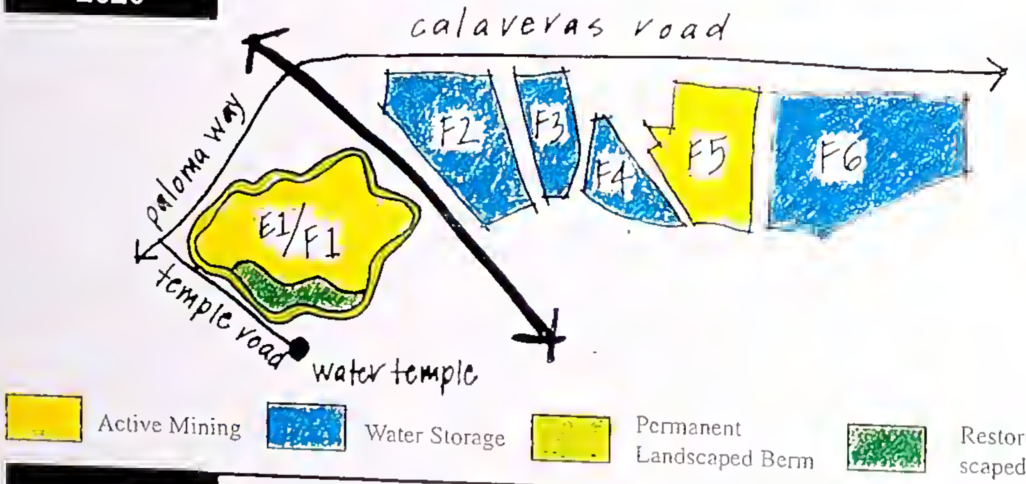
2010



Completed Pits	F2	F3	F4
Approximate Year Completed	2003	2006	1996
Approximate Usable Storage (AF)	10,300	2,800	2,800

Approximate Year 2010 Total Usable Storage: 15,900 AF

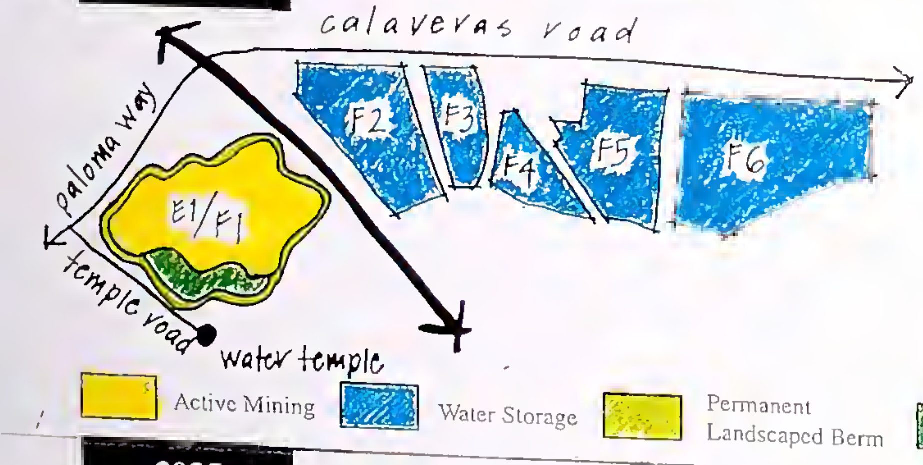
2020



Completed Pits	F2	F3	F4	F6
Approximate Year Completed	2003	2006	1996	2013
Approximate Usable Storage (AF)	10,300	2,800	2,800	19,400

Approximate Year 2020 Total Usable Storage: 35,300 AF

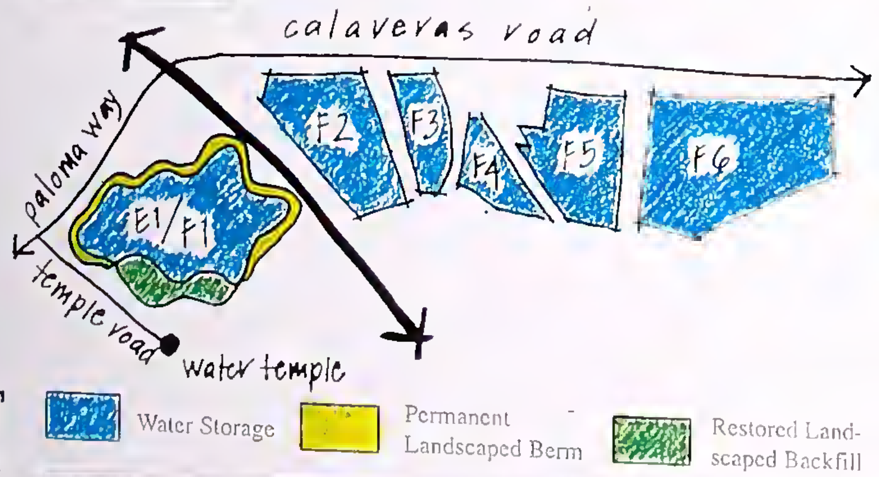
2025



Completed Pits	F2	F3	F4	F5	F6
Approximate Year Completed	2003	2006	1996	2021	2013
Approximate Usable Storage (AF)	10,300	2,800	2,800	11,800	19,400

Approximate Year 2025 Total Usable Storage: 47,100 AF

2035



Completed Pits	E1/F1	F2	F3	F4	F5	F6
Approximate Year Completed	2035	2003	2006	1996	2021	2013
Approximate Usable Storage (AF)	16,100	10,300	2,800	2,800	11,800	19,400

Approximate Year 2050 Total Usable Storage: 63,200 AF

FIGURE 13

Sunol Valley Resources Management Plan

Draft Comparison Between Alternatives

• 26 February 1996 •

	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
SFWD MISSION STATEMENT, PUC PRIORITIES AND DEPARTMENTAL VALUES						
PUC Mission Statement (Source: Public Utilities Commission, August 1995)						
" To serve San Francisco and its Bay Area Customers with reliable, high quality, and affordable water while maximizing benefits from power operations and responsibly managing the resources entrusted to its care"	• Each alternative furthers SFWD's ability to provide a reliable water supply during a drought. Land and water based recreation activities have been identified which do not pose an unacceptable risk to the quality of this water. Provision of this additional storage comes at a low cost to SFWD. Additional SFWD storage postpones SFWD's need to purchase water during a drought. Enhancement of the valley's natural and cultural resources will begin immediately so that users of this area do not have to wait for the completion of mining to enjoy the area's resources. Upon completion of mining, reclamation efforts will provide water based recreation and enhancement of the surrounding landscape to serve as a natural area.	• Same as Alternative A	• Same as Alternative A	• Same as Alternative A	• Same as Alternative A	• Same as Alternative A
PUC Priorities (Source: Public Utilities Commission, August 1995)						
Water Rights: Protect and defend	• Relocating the Alameda Creek diversion point from Sunol Temple to upstream above the quarries to the Alameda Creek Fish Release and Recapture Facility will preserve and protect existing water rights.	• Same as Alternative A	• Same as Alternative A.	• Same as Alternative A.	• Same as Alternative A.	• Same as Alternative A.
Infrastructure Maintenance: Assuring availability of facilities for water storage and conveyance, water treatment, power generation, system control, system support	• Provides no storage potential or supporting conveyance facilities beyond what the current conditions provide.	• Provides additional storage potential and conveyance facilities.	• Provides the second greatest storage potential (after Alternative F) and supporting conveyance facilities of the six alternatives.	• Same as Alternative B	• Same as Alternative B	• Provides the greatest storage potential and supporting conveyance facilities of the six alternatives.
Operations: Assure safe, reliable and legal operation of all facilities	• Additional storage aids in providing a reliable water supply during drought periods. This alternative provides no additional storage potential.	• Additional storage aids in providing a reliable water supply during drought periods. This alternative provides some additional storage potential	• Additional storage aids in providing a reliable water supply during drought periods. This alternative provides the second greatest additional storage potential (after Alternative F).	• Same as Alternative B	• Same as Alternative B	• Additional storage aids in providing a reliable water supply during drought periods. This alternative provides the greatest additional storage potential.
Efficiency and Profitability	• Use of quarry pits for storage provides additional storage at low cost.	• Same as Alternative A.	• Same as Alternative A.	• Same as Alternative A.	• Same as Alternative A.	• Same as Alternative A.
Estimated Life of Project Revenues/Costs	• Provides $24.5M in total mining revenue. Costs include $3.2M in utility relocation and $32.6M in capital improvements. Sediment removal costs range from $6.8M to $8.9M.	• Provides $53.4M in total mining revenue. Costs include $3.3M in utility relocation and $28M in capital improvements. Sediment removal costs range from $6.8M to $22.5M	• Provides $66.9M in total mining revenue. Costs include $3.3M in utility relocation and $32M in capital improvements. Sediment removal costs range from $6.8M to $22.5M.	• Provides $52.8M in total mining revenue. Costs include $3.3M in utility relocation and $32M in capital improvements. Sediment removal costs range from $6.8M to $22.5M.	• Provides $55.4M in total mining revenue. Costs include $2.1M in utility relocation and $32M in capital improvements. Sediment removal costs are estimated at $2.1M.	• Provides $67.7M in total mining revenue. Costs include $3.3M in utility relocation and $32M in capital improvements. Sediment removal costs range from $6.8M to $22.5M.
Estimated Annual Revenues/Costs	• Provides $.57M in annual lease revenues. Annual staff cost is $.13M.	• Provides $.54M in annual lease revenues. Annual staff cost is $.13M.	• Provides $.46M in annual lease revenues. Annual staff cost is $.13M.	• Provides $.49M in annual lease revenues. Annual staff cost is $.13M.	• Provides $.42 M in annual lease revenues. Annual staff cost is $.13M.	• Provides $.42 M in annual lease revenues. Annual staff cost is $.13M.

Sunol Valley Resources Management Plan

Draft Comparison Between Alternatives

• 26 February 1996 •

	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
PUC Departmental Values (Source: Public Utilities Commission, August 1995)						
"Departmental values are how we personalize the department's mission and priorities. They articulate how we would like to be remembered through our association with the PUC." These values relate to reliability, quality, responsiveness, accountability, efficiency and being a good neighbor.	• The town of Sunol is SFWD's immediate neighbor. Mining authorized by the issuance of SMP-32 created environmental concerns including noise, dust, light, traffic, visual intrusion, and landscaping. These impacts were analyzed and mitigated in the SMP-32 EIR issued by Alameda County. The EIR withstood legal challenges to the appellate level.	• This alternative has the least impact on the community of Sunol as there is no mining proposed north of I-680	• This alternative has a larger impact on the community of Sunol than Alternative A because the pit north of I-680 in this alternative is larger. Impacts on Sunol were analyzed and mitigated in the SMP-32 EIR issued by Alameda County The EIR withstood legal challenges to the appellate level.	• Same as Alternative A	• This alternative has the greatest impact on the town of Sunol because the pit north of I-680 is the largest of the six alternatives. Impacts on Sunol were analyzed and mitigated in the SMP-32 EIR issued by Alameda County. The EIR withstood legal challenges to the appellate level.	• Same as Alternative C
	• Additional storage provides additional system reliability. Land and water based activities have been identified which minimize the risk to water quality and also provide recreational opportunities for the surrounding community.	• Same as Alternative A	• Additional storage provides additional system reliability. Land and water based activities have been identified which minimize the risk to water quality. Provides less opportunity for land based recreation than Alternative A due to maximizing mining.	• Same as Alternative A	• Same as Alternative C	• Same as Alternative C
WATERSHED MANAGEMENT PLAN GOALS AND OBJECTIVES						
Primary Watershed Management Goal *• Maintain and improve source water quality to protect public health and safety*						
Apperson Ridge Quarry *Apperson Ridge Quarry is located above the San Antonio Reservoir primary watershed. It is permitted by Alameda County and has a 50-year life. Quarry operations in this location have the potential to impact water quality in SFWD's primary water storage reservoirs.*	• Provides least amount of quarrying. The availability of aggregate for the regional market from SFPUC Sunol Valley lands could defer the initiation of mining at Apperson Ridge (based upon market) conditions and other intagibles) for approximately 19 years (2015).(*)	• Provides a moderate amount of quarrying. The availability of aggregate for the regional market from SFPUC Sunol Valley lands could defer the initiation of mining at Apperson Ridge (based upon market conditions and other intagibles) for approximately 40 years (2036).(*)	• Provides the second greatest amount of quarrying. The availability of aggregate for the regional market from SFPUC Sunol Valley lands could defer the initiation of mining at Apperson Ridge (based upon market conditions and other intagibles) for approximately 51 years (2047).(*)	• Provides a moderate amount of quarrying. The availability of aggregate for the regional market from SFPUC Sunol Valley lands could defer the initiation of mining at Apperson Ridge (based upon market conditions and other intagibles) for approximately 40 years (2036).(*)	• Provides a moderate amount of quarrying. The availability of aggregate for the regional market from SFPUC Sunol Valley lands could defer the initiation of mining at Apperson Ridge (based upon market conditions and other intagibles) for approximately 42 years (2038).(*)	• Provides the greatest amount of quarrying. The availability of aggregate for the regional market from SFPUC Sunol Valley lands could defer the initiation of mining at Apperson Ridge (based upon market conditions and other intagibles) for approximately 51 years (2047).(*)

(*) Years estimated based upon combined current annual mining rates of Mission Valley Rock and Lone Star (2,200,000 tons/year). Actual mining rates and duration may vary. Years are for comparative purposes only

Sunol Valley Resources Management Plan

Draft Comparison Between Alternatives

• 26 February 1996 •

	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Recreation						
Significant interest has been exhibited in including water based recreation as part of the watershed management plans. The Sunol Valley quarry pits provide this opportunity with less risk to water quality than if water based recreation were to occur on the primary water storage reservoirs. These quarry reservoirs are intended for use during a drought and are not considered as primary reservoirs. However, there is still concern that their water quality be protected	• North of I-680: Fishing and aquaculture are included in this area.	• North of I-680. No water storage	• North of I-680: A swimming lagoon has been provided in this alternative. No activities are permitted in the storage pit north of the freeway	• North of I-680: Non-motorized boating and fishing are included in this pit. Provision for swimming has not been made in this alternative.	• Same as Alternative D	• Same as Alternative D
	• South of I-680: A swimming pit has been provided in this alternative. Non-motorized boating is also permitted in the northernmost lake south of the freeway.	• South of I-680: Non-motorized boating is permitted in the northernmost lake south of the freeway.	• South of I-680: Non-motorized boating is permitted in the northernmost lake south of the freeway.	• South of I-680: In consideration of water quality, no water-based recreation is proposed for the pits south of the freeway. This decision makes this alternative the most sensitive to water quality concerns.	• Same as Alternative D	
Therefore, body contract recreation shall not be permitted in these reservoirs. Swimming pits have been provided in certain alternatives. All boating shall be non-motorized.	• Provides the second greatest amount and variety of recreation activity after Alternative C of the six alternatives due to the inclusion of a swimming pit.	• Provides a moderate amount and variety of recreation activities.	• Provides the greatest amount and variety of recreation activity of the six alternatives due to the inclusion of a swimming pit, water slide and related activities.	• Same as Alternative B	• Same as Alternative B	• Same as Alternative B
Secondary Watershed Management Goals						
• *Maximize the contribution of the watersheds to water supply*	• Provides opportunity to capture excess water in wet years and store it for dry years. This alternative provides the least amount of potential storage of the six alternatives.	• Provides opportunity to capture excess water in wet years and store it for dry years. This alternative provides a moderate amount of potential storage.	• Provides opportunity to capture excess water in wet years and store it for dry years. This alternative provides the second greatest (after Alternative F) amount of potential storage of the six alternatives.	• Same as Alternative B	• Same as Alternative B	• Provides opportunity to capture excess water in wet years and store it for dry years. This alternative provides the greatest amount of potential storage of the six alternatives.
• *Preserve and enhance the ecological and cultural resources of the watersheds*	• Moderate disturbance to the environment north of I-680 due to smaller size of quarry pit. Existing and potential buried cultural resources are some distance from mining in this alternative. Provides a moderate sized interpretive area	• Provides the least disturbance to the environment north of I-680 due to absence of mining. Existing and potential buried cultural resources are not disturbed by mining. Provides a moderate sized interpretive area.	• Provides significant disturbance to the environment north of I-680 due to size of quarry pit. Existing and potential buried cultural resources are closer to mining. Provides a moderate sized interpretive area.	• Same as Alternative A	• Provides the greatest disturbance to the environment north of I-680 due to size of quarry pit. Existing and potential buried cultural resources are closest to mining in this alternative. Provides smallest interpretive area.	• Provides the second greatest disturbance to the environment north of I-680 (after Alternative E) due to size of quarry pit. Provides largest interpretive area due to the 1320-foot setback from the quarry pit.
• *Protect the watersheds, adjacent urban areas and the public from fire and other hazards*	• Although not intended for fire fighting, water stored in these reservoirs would provide water for fire suppression in nearby watershed areas.	• Same as Alternative A	• Same as Alternative A	• Same as Alternative A	• Same as Alternative A	• Same as Alternative A
• *Continue existing compatible uses and provide opportunities for potential compatible uses on watershed lands including educational, recreational and scientific uses*	• Provides the greatest variety of recreation activities of any alternative. Provides fishing, interpretive/events area, overnight nature study, boating, group picnicking, swimming, trails, and RV camping.	• Provides a wide variety of recreation activities. Provides fishing, interpretive/events area, overnight nature study, boating, group picnicking, trails, and RV camping.	• Provides the greatest variety and amount of recreation activities. Provides fishing, interpretive/events area, overnight nature study, boating, group picnicking, swimming and trails.	• Provides a wide variety of recreation activities. Provides fishing, interpretive/events area, overnight nature study, boating, group picnicking, trails, and RV camping.	• Provides a wide variety of recreation activities. Provides fishing, interpretive/events area, overnight nature study, boating, picnicking and trails.	• Provides a wide variety of recreation activities. Provides fishing, interpretive/events area, overnight nature study, boating, picnicking and trails.
• *Provide a balance between financial resources, revenue generation activities and overall benefits*						
Estimated Life of Project Revenues/Costs	• Provides $24.5M in gross mining revenue. Revenues do not include the asset value of the completed reservoirs. Costs include $3.2M in utility relocation and $32.6M in capital improvements. Sediment removal costs range from $6.8M to $8.9M.	• Provides $53.4M in gross mining revenue. Revenues do not include the asset value of the completed reservoirs. Costs include $3.3M in utility relocation and $28M in capital improvements. Sediment removal costs range from $6.8M to $22.5M.	• Provides $66.9M in gross mining revenue. Revenues do not include the asset value of the completed reservoirs. Costs include $3.3M in utility relocation and $32M in capital improvements. Sediment removal costs range from $6.8M to $22.5M.	• Provides $52.8M in gross mining revenue. Revenues do not include the asset value of the completed reservoirs. Costs include $3.3M in utility relocation and $32M in capital improvements. Sediment removal costs range from $6.8M to $22.5M.	• Provides $55.4M in gross mining revenue. Revenues do not include the asset value of the completed reservoirs. Costs include $2.1M in utility relocation and $32M in capital improvements. Sediment removal costs are estimated at $2.1M.	• Provides $67.7M in gross mining revenue. Revenues do not include the asset value of the completed reservoirs. Costs include $3.3M in utility relocation and $32M in capital improvements. Sediment removal costs range from $6.8M to $22.5M.
Estimated Annual Revenues/Costs	• Provides $.57M in annual lease revenues. Annual staff cost is $.13M.	• Provides $.54M in annual lease revenues. Annual staff cost is $.13M.	• Provides $.46M in annual lease revenues. Annual staff cost is $.13M.	• Provides $.49M in annual lease revenues. Annual staff cost is $.13M.	• Provides $.42M in annual lease revenues. Annual staff cost is $.13M.	• Provides $.42M in annual lease revenues. Annual staff cost is $.13M.

Sunol Valley Resources Management Plan

Draft Comparison Between Alternatives

• 26 February 1996 •

	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
• *Enhance public awareness of water quality, water supply, conservation and watershed protection issues.*	• Each alternative provides opportunities for public education due to the inclusion of interpretive facilities, natural areas, trails and overnight nature study areas. This alternative provides a moderate sized interpretive area.	• Same as Alternative A	• Same as Alternative A	• Same as Alternative A	• Each alternative provides opportunities for public education due to the inclusion of interpretive facilities, natural areas, trails and overnight nature study areas. This alternative provides the smallest interpretive area.	• Each alternative provides opportunities for public education due to the inclusion of interpretive facilities, natural areas, trails and overnight nature study areas. This alternative provides the largest interpretive area and greater educational opps.
WATER SUPPLY						
Total Storage (**)	33,700 AF • Five storage pits - one north of I-680 and four south of I-680	51,800 AF • Four storage pits - all south of I-680	62,600 AF • Six storage pits - one north of I-680 and five south of I-680	52,300 AF • Six storage pits - one north of I-680 and five south of I-680	53,100 AF • Five storage pits - one north of I-680 and four south of I-680	63,200 AF • Six storage pits - one north of I-680 and five south of I-680
(**) Assumes 5% dead storage, mining up to 200' and a 1.75:1 sideslope						
Estimated Timing/Phasing	• Mining of all pits completed in approximately 19 years (2015). (***)	• Mining of all pits completed in approximately 40 years (2036). (***)	• Mining of all pits completed in approximately 51 years (2047). (***)	• Mining of all pits completed in approximately 40 years (2036). (***)	• Mining of all pits completed in approximately 42 years (2038). (***)	• Mining of all pits completed in approximately 51 years (2047). (***)
	(***) Years estimated based upon combined current annual mining rates of Mission Valley Rock and Lone Star (2,200,000 tons/year) Actual mining rates and duration may vary. Years are for comparative purposes only.					
MINING/WATER STORAGE CONCEPT						
North of I-680	• Mining of existing leased and permitted quarry (SMP-29). This permit was superseded by SMP-32.	• No mining.	• Mining of existing permits (SMP-32) with reduction in size of SMP-32 from 139 SA to approximately 125 SA.	• Same as Alternative A	• Mining of existing permits (SMP-32 - 139 SA)	• Mining of existing permits (SMP-32) with reconfiguration of SMP-32 from 139 SA to 129 SA.
South of I-680	• Mining of permitted, leased quarries	• Requires expansion and amendment of existing permits and leases.	• Same as Alternative B	• Same as Alternative B	• Same as Alternative A	• Same as Alternative B
RECREATION AND OTHER ACTIVITIES						
North of I-680 *Blank boxes indicate activity is not included in the alternative*						
	• Commercial Site (Gas, Groceries)	• Commercial Site (Gas, Groceries)	• Commercial Site (Gas, Groceries)			
	• Farmers Market	• Farmers Market		• Farmers Market		
		• RV Campground		• Alternative locations for RV camping in this alternative are south of the Hetch Hetchy aqueduct and north of the SFWD Sunol operation facilities.		
			• Swimming Lagoon - Beach, Picnic Site, Concession			
				• Boating Facility - Marina, Boat Launch, Boat Rental, Concessionaire		
	• Organic/Working Farm	• Organic/Working Farm		• Working Farm/Vineyard	• Agriculture/Vineyard/Nursery/ Wetlands/Aquaculture	• Agriculture/Vineyard/Nursery/ Wetlands/Aquaculture
	• Overnight Nature Study	• Overnight Nature Study	• Overnight Nature Study	• Alternative locations for overnight nature study in this alternative are south of the Hetch Hetchy aqueduct and north of the SFWD Sunol operation facilities.		
	• Fishing Area/Aquaculture			Fishing Area · Shoreline Fishing, Fishing Pier; Aquaculture		

Sunol Valley Resources Management Plan

Draft Comparison Between Alternatives

• 26 February 1996 •

	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
North of I-680 (continued)						
	• Landscaped mounds and buffers		• Landscaped mounds and buffers	• Landscaped mounds and buffers	• Landscaped mounds and buffers	• Landscaped mounds and buffers
	• Interpretive Area/Events Site - Water Temple, Archaeological Sites, Amphitheater, Picnic Area, Events Building	• Interpretive Area/Events Site - Water Temple, Archaeological Sites, Amphitheater, Picnic Area, Events Building	• Interpretive Area/Events Site - Water Temple, Archaeological Sites, Amphitheater, Picnic Area, Events Building	• Interpretive Area/Events Site - Water Temple, Archaeological Sites, Amphitheater, Picnic Area, Events Building	• Interpretive Area- Water Temple, Archaeological Sites, Picnic Area	• Interpretive Area - Water Temple, Archaeological Sites, Picnic Area
	• Parking	• Parking	• Parking	• Parking	• Parking	• Parking
	• Staging/Trail Heads	• Staging/Trail Heads	• Staging/Trail Heads	• Staging/Trail Heads	• Staging/Trail Heads	• Staging/Trail Heads
		• Group Picnic Area				
	• Alameda Creek Enhancement/Natural Area	• Alameda Creek Enhancement/Natural Area	• Alameda Creek Enhancement/Natural Area	• Alameda Creek Enhancement/Natural Area	• Alameda Creek Enhancement/Natural Area	• Alameda Creek Enhancement/Natural Area
	• Trail Connections to Niles Canyon/Pleasanton Ridge (EBRPD)	• Trail Connections to Niles Canyon/Pleasanton Ridge (EBRPD)	• Trail Connections to Niles Canyon/Pleasanton Ridge (EBRPD)	• Trail Connections to Niles Canyon/Pleasanton Ridge (EBRPD)	• Trail Connections to Niles Canyon/Pleasanton Ridge (EBRPD)	• Trail Connections to Niles Canyon/Pleasanton Ridge (EBRPD)
South of I-680 *Blank boxes indicate activity is not included in the alternative*						
				• Commercial Site (Gas, Groceries)	• Commercial Site (Gas, Groceries)	• Commercial Site (Gas, Groceries)
	• Group Picnic Area					
	• Boating Facility - Marina, Boat Launch, Boat Rental, Concessionaire	• Boating Facility - Marina, Boat Launch, Boat Rental, Concessionaire	• Boating Facility - Marina, Boat Launch, Boat Rental, Concessionaire			
	• Swimming Lagoon - Beach, Water Slide, Scuba Training, Picnic Area, Concessionaire					
	• RV Campground			• Alternative locations for RV Campground are located south of the Hetch Hetchy Aqueduct and north of the Sunol Operations Facility.		
		• Fishing Area - Shoreline Fishing, Fishing Pier	• Fishing Area - Shoreline Fishing, Fishing Pier			
	• Trail Connections to Sunol Regional Wilderness (EBRPD)	• Trail Connections to Sunol Regional Wilderness (EBRPD)	• Trail Connections to Sunol Regional Wilderness (EBRPD)	• Trail Connections to Sunol Regional Wilderness (EBRPD)	• Trail Connections to Sunol Regional Wilderness (EBRPD)	• Trail Connections to Sunol Regional Wilderness (EBRPD)
					• Agriculture/Nurseries	
				• Alternative locations for Overnight Nature Study are located south of the Hetch Hetchy Aqueduct and north of the Sunol Operations Facility.	• Overnight Nature Study located south of the Hetch Hetchy aqueduct	• Overnight Nature Study located south of the Hetch Hetchy aqueduct
NATURAL RESOURCES						
San Antonio Creek	• Retains San Antonio Creek	• Removes San Antonio Creek to maximize storage.	• Same as Alternative A	• Same as Alternative A	• Same as Alternative A	• Same as Alternative A
Conservation Easement *A conservation easement is proposed over the lands north of the freeway to preserve this area, in perpetuity, as a natural area for passive recreation, and to protect it from development, further quarrying or other urban activity.*	• None. Concept generated during public workshops.	• Same as Alternative A	• Same as Alternative A	• Places conservation easement over entire area north of I-680 to protect area from further disturbance, in perpetuity.	• None proposed.	• None proposed.

Sunol Valley Resources Management Plan

Draft Comparison Between Alternatives

• 26 February 1996 •

	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
CULTURAL RESOURCES						
Sunol Temple *The Sunol Water Temple - Conservation Report, prepared by Randolph Langenbach identifies the original design of the temple by Willis Polk as including the entry gate at Paloma Way, the 1/2-mile promenade terminating at the temple, and the temple itself. The report recommends a 1320-foot to 2640-foot setback from the temple to maintain the original integrity of this design. SMP-32 provides a 600-foot setback.*	• Provides a small interpretive/natural area near Sunol Temple. The size of the interpretive area is small due to the proximity of adjacent activities.	• Provides interpretive/natural area near Sunol Temple. The size of the interpretive/natural area is somewhat larger than Alternative A as there is no mining north of I-680 in this alternative.	• Same as Alternative A • Provides axial entry to temple retaining historic entry axis.	• Same as Alternative A	• Provides the smallest interpretive/natural area near Sunol Temple due to the maximum pit size in this alternative. • Provides axial entry to temple retaining historic entry axis. • Provides a 600-foot setback from temple.	• Provides the largest interpretive/natural area near Sunol Temple of any of the six alternatives due to the 1320-foot setback from the temple and the dedication of this entire setback for archeological/natural resource interpretation. • Provides landscaped axial entry to temple retaining/restoring historic entry axis. • Provides 1320-foot setback from temple
Prehistoric/Historic Resources	• Mining set back north of I-680 so as to not disturb prehistoric archeological site. No known resources south of I-680.	• Mining is not proposed north of I-680 therefore alternative poses less threat to cultural resources. No known cultural resources south of I-680.	• Mining set back north of I-680 so as to not disturb prehistoric archeological site. No known resources south of I-680.	• Mining set back north of I-680 so as to not disturb prehistoric archeological site. No known resources south of I-680.	• Mining set back north of I-680 so as to not disturb prehistoric archeological site. No known resources south of I-680. • Provides a 600-foot setback from temple providing the least protection for potential buried cultural resources between the temple and the quarry pit.	• Mining set back north of I-680 so as to not disturb prehistoric archeological site. No known resources south of I-680. • Provides 1320-foot setback from temple and provides the greatest protection for potential buried cultural resources between the temple and the quarry pit.
ALAMEDA COUNTY ISSUES						
Alameda County's general concerns include: SFWD alternatives do not acknowledge existing permits; SFWD may find it difficult to obtain County approvals for other projects if they are not cooperative with those items the County has already approved. SFWD may be overestimating the amount of water storage they can get in the Sunol Valley as Alameda County may be unwilling to amend existing permits or grant new ones for expanded quarrying. *The County also stated that the relocation of utilities, mining of silt ponds and the relocation of mining equipment may be overly ambitious.*	• This alternative does not honor SMP-32 but does honor SMP-29. Mining south of I-680 includes existing permits and leases which is preferable to Alameda County.	• This alternative does not honor SMP-29 or SMP-32. Maximizing mining south of I-680 requires amended and new permits from the County which may not be granted in light of not honoring these existing permits and the environmental climate of the County.	• This alternative honors SMP-32 with modifications. Maximizing mining south of I-680 requires amended and new permits from the County which may not be granted due to the current environmental climate of the County.	• This alternative does not honor SMP-32 but does honor SMP-29. Maximizing mining south of I-680 requires amended and new permits from the County which may not be granted in light of not honoring SMP-32 and the current environmental climate of the County	• This alternative is Alameda County's preferred alternative as it includes all existing approved permits and does not identify any additional permitted areas.	• This alternative honors SMP-32 with minor modifications. Maximizing mining south of I-680 requires amended and new permits from the County which may not be granted due to the current environmental climate of the County.
SUNOL COMMUNITY ISSUES *The areas of concern for the Sunol community relate to quarrying north of I-680 and include, noise, dust, traffic, nightlighting, landscaping, duration and timing of mining and land use compatibility.*	• The community of Sunol opposes this alternative.	• This alternative is the Sunol community's preferred alternative (with minor modifications) due to the absence of mining north of I-680 and the generally passive activities on this site.	• Same as Alternative A	• Same as Alternative A	• Same as Alternative A	• Same as Alternative A

Sunol Valley Resources Management Plan

Draft Comparison Between Alternatives

• 26 February 1996 •

	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
MISSION VALLEY ROCK ISSUES						
Overall Issues *Mission Valley Rock's primary concern is that they be allowed to mine SMP-32 as permitted by the County.*	• Does not honor SMP-32 which is permitted by Alameda County but not leased for quarry operations by SFWD. Honors SMP-29 which is both permitted and leased and was superseded by SMP-32.	• Does not honor SMP-32 which is permitted by Alameda County but not leased for quarry operations by SFWD. Does not honor SMP-29 which is permitted by Alameda County and leased for quarrying by SFWD	• Requires some modification of SMP-32 mining, reclamation and mitigation plans to result in a modified pit size of approximately 124 SA.	• Same as Alternative A	• Honors SMP-32 (139 SA) as it was approved by Alameda County.	• Requires minor modification to result in a final reclaimed pit size of approximately 129 SA to provide additional mitigation for the Sunol Temple area.
SMP-32 Permit Issues *SMP-32 has 93 conditions which must be satisfied before, during and after mining of this area is completed*	• Reflects the pit permitted in SMP-29. SMP-29 was superseded by SMP-32. Requires modification of SMP-32 to reconfigure mining, reclamation and mitigation plans.	• Does not apply as quarrying is not proposed north of I-680 in this alternative.	• Requires some modification of SMP-32 to reconfigure mining, reclamation and mitigation plans. Complies with most conditions of SMP-32, most notably numbers 4, 13, 18, 19, 23, 24, 25, 26, 32, 49, 53, 68, 69, and 70.	• Same as Alternative A	• This alternative reflects all plans and conditions of SMP-32.	• Requires minor modification to result in a final reclaimed pit size of approximately 129 SA to provide additional mitigation for the Sunol Temple area.
LONE STAR ISSUES						
Lone Star's is interested in extending their current leases to 2021 and increasing their mining depth to 200'	• All Sunol Valley alternatives include modifying existing leases so mining can be extended to 200'. Leases will be competitively bid where feasible.	• Same as Alternative A	• Same as Alternative A	• Same as Alternative A	• Same as Alternative A	• Same as Alternative A
ESTIMATED LIFE OF PROJECT REVENUES (a)						
Total Mining Revenue (b) (c)	$24.50 M	$53.40 M	$66.90 M	$52.80 M	$55.40 M	$67.70 M
ESTIMATED CAPITAL COSTS (a)						
Utility Relocation Costs (b) (d)	$3.20 M	$3.30 M	$3.30 M	$3.30 M	$2.10 M	$3.30 M
Capital Improvement Costs (b)	$32.60 M	$28.00 M	$32.00 M	$32.00 M	$32.00 M	$32.00 M
Sediment Removal Costs (b)	$6.8 M to $8.9 M	$6.8 M to $22.5 M	$6.8 M to $22.5 M	$6.8 M to $22.5 M	$2.1 M	$6.8 M to $22.5 M
ESTIMATED ANNUAL REVENUES (a)						
Annual Lease Revenue (e)	$0.57 M	$0.54 M	$0.46 M	$0.49 M	$0.42 M	$0.42 M
ESTIMATED ANNUAL COSTS (a)						
Annual Staff Costs (f) (g)	$0.13 M	$0.13 M	$0.13 M	$0.13 M	$0.13 M	$0.13 M

FOOTNOTES

(a) All costs and revenues are in 1995 dollars.

(b) Mining revenue, utility relocation costs, capital improvement costs and sediment removal costs have been projected over the life of the project.

(c) Assumes 20% spoil, 1.62 tons/CY, .60 cents/ton royalty

(d) Does not include substation

(e) Assumes SFWD issues a master RFP for entire north of freeway area.

SFWD will entertain the idea of having different concessionaires operate different facilities (RV park, commercial site etc.).

SFWD terms for leases will be a base rent plus a percent of gross annual revenues (3% - 7%)

Improvements to make revenue generating activities viable would be the responsibility of the concessionaire

Based upon PUC direction, all costs shall be borne by the lessee/concessionaire so as to not pass on costs for non-water activities to the rate payers. This may require longer term leases to assure improvements are made.

Leases for revenue generating activities (events facility) would include provisions for the maintenance and care of non-revenue generating activities (e.g. water temple).

(f) Assumes 2 FTE - one to manage leases and concessions and one to cover security/day to day issues.

(g) Annual O and M and energy costs associated with quarry facilities are dependent on water quality operations and drought operations and have not been included in this estimate.

Note: There is no alternative that compares these costs to alternative storage facilities elsewhere, outside of the Sunol Valley

REFERENCES

Stewart, E.H.
Sunol Water Temple Assessment Report
City and County of San Francisco Public Utilities Commission
September 1995

Alameda County Planning Department
Environmental Impact Report Appendix
Mission Valley Rock Company Surface Mining Permit and Reclamation Plan SMP-32
November 1994

Alameda County Planning Department
Final Environmental Impact Report
Mission Valley Rock Company Surface Mining Permit and Reclamation Plan SMP-32
November 1994

Alameda County Planning Department
Draft Environmental Impact Report
Mission Valley Rock Company Surface Mining Permit and Reclamation Plan SMP-32
June 1994

David L. Gates and Associates
Mission Valley Rock
October 1994
Note: The above document is not titled but contains landscaping plans pursuant to SMP-32

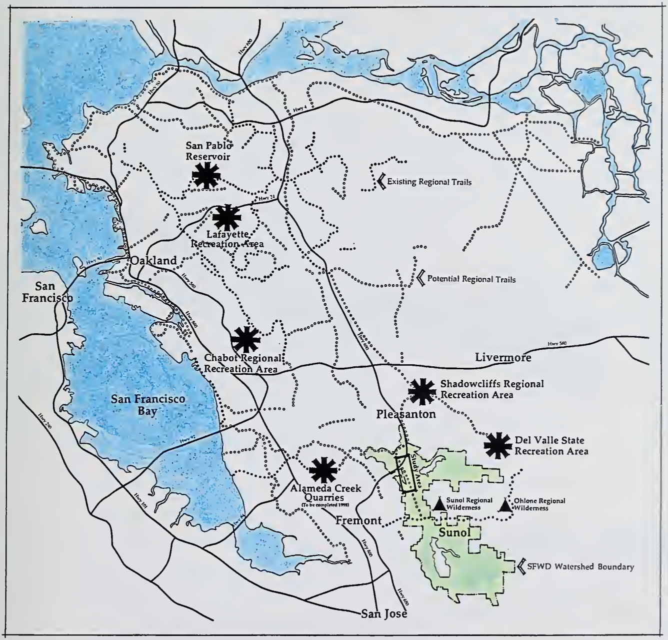
APPENDIX

Meeting Summaries and Minutes

SFPUC Meeting Minutes: March 12, 1996
SFPUC Meeting Minutes: March 26, 1996
SFPUC Meeting Minutes: April 9, 1996
SFPUC Meeting Minutes: May 14, 1996

Meeting Graphics

Regional Recreation
Is It Possible to Convert a Gravel Quarry to Water Storage and a Recreation Amenity: Some Successful Examples
Comparable Scales
Representative Sections

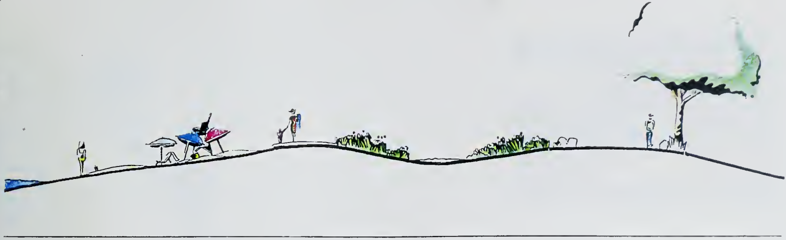


Regional Recreation

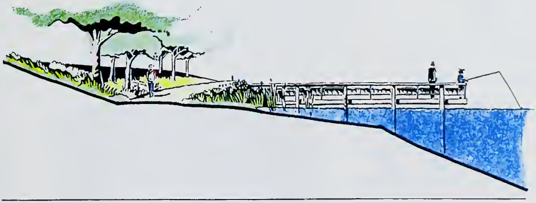
10,240 acres
2560 acres
640 acres

0 2 miles 6 miles 10 miles
1 mile 4 miles 8 miles 12 miles

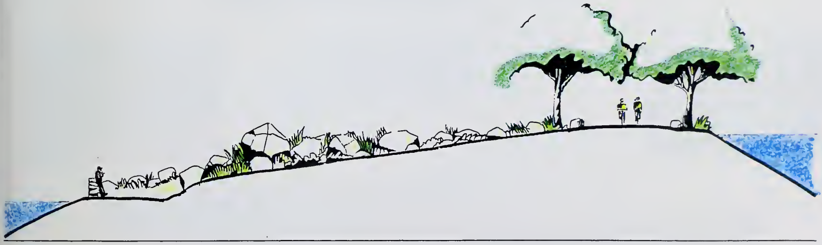
EDAW, Inc.



Section through Beach Area

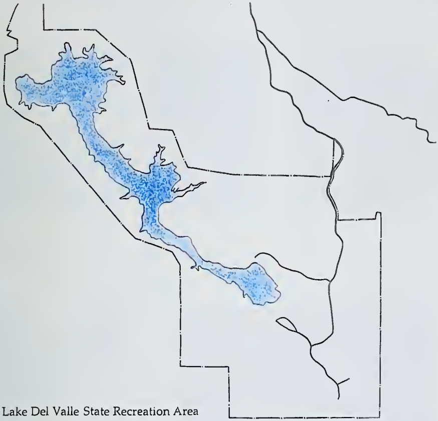


Section through Fishing Pier

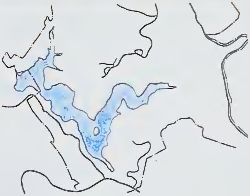


Section through Water's Edge Trail

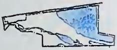
Representative Sections



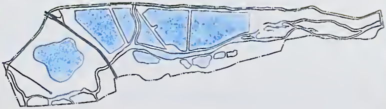
Lake Del Valle State Recreation Area



Lake Chabot Regional Park

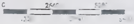


Shadowcliffs Regional
Recreation Area



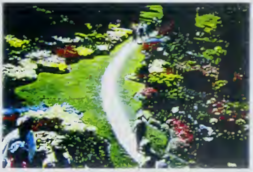
Sunol Valley

Comparable Scales



EDAW, Inc.

Shadowcliffs Regional
Recreation Area
Livermore, California

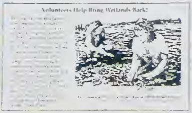


Buchard Gardens
Victoria, British Columbia

Thornton Pits
Thornton, Colorado

Tuolumne River
Stanislaus County, California

Cooley Pits
South Platte River
Littleton, Colorado



Volunteers Help Bring Wetlands Back!

Is It Possible to Convert a Gravel Quarry to Water Storage and a Recreation Amenity?

Some Successful Examples

MINUTES

PUBLIC UTILITIES COMMISSION

CITY AND COUNTY OF SAN FRANCISCO

Willie L. Brown, Jr. MAYOR

SPECIAL MEETING

March 12, 1996 7:00 P.M. Board of Supervisors Legislative Chambers War Memorial Building 401 Van Ness Avenue, San Francisco

COMMISSIONERS

Marion E. Otsea, President

Henry E. Berman, Vice President

E. Dennis Normandy

Robert K. Werbe

Victor G. Makras

DEPARTMENTS BUREAUS

Water Department Engineering and Construction Management

Hetch Hetchy Finance

Information Systems

Personnel and Training

System Planning and Regulatory Compliance

Anson B. Moran

GENERAL MANAGER

Romaine A. Boldridge

SECRETARY

1. Call to Order: 7:17 p.m.

2. Roll Call: Present - President Marion E. Otsea, Commissioner E. Dennis Normandy, Commissioner Henry E. Berman, Commissioner Victor G. Makras

Excused - Commissioner Robert K. Werbe

3. Presentation of and hearing on the Sunol Valley Resources Management Plan for the San Francisco Water Department.

Ed Stewart, Watershed Manager, discussed the objectives and history of the planning process for developing the Sunol Valley Resources Management Plan.

David Blau of EDAW, Inc., consultant for the project, showed diagrams of each of the six alternatives for quarrying in the Sunol Valley. The six alternatives were: Alternative A - assumes that all existing permits and leases would apply for determining water storage and maximizes other recreational uses; Alternative B - maximizes mining for water storage in the south and look at developing north of the freeway for resource protection management, education and other activities; Alternative C - looked at the largest surface mining permit application which would be more mining north and south of the freeway; Alternative D - maximizes storage south of the freeway and acknowledges SMP 29 north of the freeway and enhances activities near the temple and added a campground at the south end; Alternative E - increases the size of the pit north of the freeway; and Alternative F - maximizes water storage south of the freeway and provides a buffer zone around the temple north of the freeway.

4. Public Comments

Jocelyn Combes, a member of the Board of Directors of the East Bay Regional Park District, representing Southern Alameda County expressed support for Alternative F as it provided for preservation of the Sunol Water Temple. In order to minimize future operating costs, the preferred alternative should take into consideration a mix of facilities that can provide revenue generation and centralization of facilities for operational efficiencies. Alternative D provides the best centralized recreational opportunity.

Adolph Martinelli, Planning Director of Alameda County, said that the statement made by the consultant in the "Draft Comparison Between Alternatives" was incorrect. He said that Alameda County did not oppose expanded mining south of the freeway. He stated that they merely pointed out that the approval process for mining permits is difficult, expensive and complex with respect to environmental documentation. He stated that Alternative E maximizes quarry resources in the area and water storage capabilities on the north side of the freeway. He said the County of Alameda would be open to alternatives that would expand mining on the south side of the freeway subject to reservation they would maintain that reasonable setback from certain areas. He commented that none of the alternatives were absolute. He suggested that they could combine features, such as RV campgrounds or the mining portion on the south side of the freeway in they could combine Alternative F with Alternative E on the north side of the freeway to obtain a larger storage area and more economic return to the City.

Patricia Stillman, President, Save Our Sunol, commented in support of Alternative B as it would keep quarries on the south or east side of I-680 and place other activities on the north or west side of I-680. She expressed opposition to Alternatives E and F. She said that the community of Sunol could compromise with Alternative D if SMP 29 could not be rescinded.

Pete Cotter of Santa Clara Sand & Gravel Co., a wholly-owned subsidiary of RMC Lonestar, commented that in as far as the plan affects the area south of San Antonio Creek and west of Alameda Creek where they are currently mining, other than a few simple changes all the plans have merit.

William Howard, representing Mission Valley Rock, urged the Commission to consider Alternative E.

Maryanne Canaparo commented in support of any combination of Alternatives A, B or D and the portion of Alternative F which addresses the water temple. She commented that the community of Sunol would be heavily impacted by Alternatives C, E, and F.

Mike Cerny, a farmer in Sunol, commented that agriculture had been left out of the plan. He spoke of the need for more agriculture in the area.

Nancy Davis, Save Our Sunol, commented regarding Alameda County issues addressed in the "Draft Comparison between Alternatives" prepared by EDAW regarding implications made by Alameda County that the Water Department would find it difficult to obtain County approvals for other projects if the Water Department were not cooperative with those items the County had already approved. She urged that the Commission investigate this matter.

Joanne Dean-Freemire, resident of Sunol, commented in support of Alternative D as originally drafted with the addition of nurseries and Alternative A that minimizes quarrying. She opposed putting SMP 32 on the northwest side of the freeway.

Cindy Frillman urged the Commission to implement a plan that does not quarry on the north side of the freeway. She expressed support for Alternatives B or D.

Howard Hamburg, Director and Chief Operating Officer, Renaissance Entertainment Corporation, commented in support of the goals of the watershed management plan to preserve and enhance Arroyo Dela Laguna.

Diane Tiessen, Save our Sunol, read a letter from Graham & Victoria Barnes of 1415 Kilkare Road in Sunol, expressing their preference for Alternative B and expansion of quarries on the far south side of I-680 and opposing Alternatives D,E and F. Ms. Tiessen, spoke on her own behalf and said that she would like to preserve Sunol as a historical area.

Ario Ysit commented that approval of SMP 32 ensures that there would be no development in the valley. He said a lake in the middle of the valley would benefit everybody.

Mr. Martinelli stated that the Sunol Water Temple should be retained and that the County of Alameda would be willing to cooperate with San Francisco in restoring the temple. He expressed objections to the language implied in the consultant's comparison of alternatives on Alameda County issues.

Commissioner Normandy suggested looking at a hybrid alternative that maximizes the protection around the Sunol Temple, the City's mining revenue and usable storage.

Commissioner Normandy moved, seconded by Commissioner Berman, to close the public hearing; carried (4-0) by unanimous vote.

Thereupon, the meeting was adjourned: 9:05 p.m.

Romaine A. Boldridge Secretary

City Departments Information Center Community Resources

©1997, 1998 City & County of San Francisco

06/03/1998

MINUTES

PUBLIC UTILITIES COMMISSION

CITY AND COUNTY OF SAN FRANCISCO

Willie L. Brown, Jr. MAYOR

REGULAR MEETING

March 26, 1996 1:00 P.M. Room 402 1155 Market Street, Fourth Floor

COMMISSIONERS

Marion E. Otsea, President

Henry E. Berman, Vice President

E. Dennis Normandy

Robert K. Werbe

Victor G. Makras

DEPARTMENTS BUREAUS

Water Department Engineering and Construction Management

Hetch Hetchy Finance

Information Systems

Personnel and Training

System Planning and Regulatory Compliance

Anson B. Moran

GENERAL MANAGER

Romaine A. Boldridge

SECRETARY

1. CALL TO ORDER: 1:00 p.m.

2. ROLL CALL: Present - President Marion E. Otsea, Vice President Henry E. Berman, Commissioner E. Dennis Normandy, Commissioner Victor G. Makras

Excused - Commissioner Robert K. Werbe

3. APPROVAL OF MINUTES

Motion made by Commissioner Normandy, seconded by Commissioner Berman, to approve the Minutes of the Regular Meeting of February 13, 1996, the Minutes of the Regular Meeting of February 27, 1996 as amended, and the Minutes of the Regular Meeting of March 12, 1996; carried (4-0) by unanimous vote.

4. COMMUNICATIONS

No action was taken.

5. INTRODUCTION OF OLD BUSINESS BY COMMISSIONERS

No old business was introduced by Commissioners.

6. INTRODUCTION OF NEW BUSINESS BY COMMISSIONERS

No new business was introduced by Commissioners.

7. REPORT OF THE GENERAL MANAGER

Olympic Club

Joshua Milstein, Deputy City Attorney, reported that the Olympic Club had agreed to take tertiary water from the City of Daly City. The agreement was prompted by the fact that the Olympic Club was trying to expand its golf course west of Skyline Boulevard located in both San Mateo and San Francisco Counties. The Club sought approval from San Mateo County for a coastal development permit and the Coastal Commission granted the permit without consideration of the environmental impact of increased ground water withdrawal from Lake Merced. Mr. Milstein stated that President Otsea wrote a letter to the California Coastal Commission urging denial of the permit pending the signing of a recycled water contract with Daly City or an environmental review of increased ground water withdrawal. In a meeting held with Club lawyers and Supervisor Barbara Kaufman last week, the Club agreed to take a position before the Coastal Commission that approval of the permit be conditioned on the signing of a recycled water agreement with the City of Daly City. Mr. Milstein suggested that the Club should pay for the quantity of water that the San Francisco Water Department adds to the lake.

Redevelopment Agency

Anson B. Moran, General Manager of Public Utilities, reported that the San Francisco Redevelopment Agency was proposing that the Public Utilities Commission pick up the water utility obligation and possibly the electricity utility obligation for Hunters Point Shipyard and the Treasure Island. He said that the Redevelopment Agency was also looking at opportunities of designating redevelopment buildings and projects as municipal loads. Mr. Moran stated that it would give PUC access to transmission paths and would provide a source of customers for PUC. He said that the Agency also expressed interest in establishing some kind of incentive rate structure that could attract people to relocate in redevelopment areas. Mr. Moran noted that the combination of transmission paths as municipal load plus additional customer base may provide room for doing an incentive structure. Commissioner Berman noted that PUC should consider those kind of incentives that would attract business in San Francisco as long as PUC is not the only participating agency. Commissioner Makras expressed his opinion that the posture should be what it means to our ratepayers and that we should not enter into negotiations based upon what we are going to give.

8. PUBLIC COMMENTS

There were none.

9. To consider adopting the Sunol Valley Resource Management Plan for the San Francisco Water Department.

Motion made by Commissioner Berman, seconded by Commissioner Normandy to continue Item 9 to April 9, 1996; carried (4-0) by unanimous vote.

10. Authorizing solicitation of qualifications and proposals to conduct a preliminary study of municipalizing the electric utility system.

Lawrence T. Klein, General Manager, Hetch Hetchy Water & Power, reported that the Technical Review Committee convened its initial meeting on March 18, 1996. The committee is currently composed of representatives from San Franciscans for Public Power, Northern California Power Agency, City of Palo Alto, Natural Resources Defense Council, San Franciscans for Tax Justice, UC Energy Institute, PUC Consultant Wally Mcouat, PUC (Larry Klein), and ex-officio member Bayard Fong. Mr. Klein stated that the Controller's Office and the Bay Area Council indicated interests to serve on the Committee but they have not yet named a representative. Commissioner Makras recommended that staff set a deadline for completing the composition of the Committee.

Mr. Klein stated that a member of the Technical Review Committee proposed that a copy of the draft report be distributed to the Board of Supervisors Select Committee when it is distributed to the Commission. President Otsea directed staff to go ahead with this proposal.

Mr. Klein noted that the Committee also expressed concerns that prohibition of any follow-on work would restrict the number of bidders bidding for the project. He said the number of bidders last time were limited. He requested that the Commission remove the clause regarding prohibition of follow-on work. Mr. Moran stated that if the Commission wants the option of excluding a consultant from additional work at a future date there has to be exclusionary language in the bid document. The Commission agreed to leave the language of no follow-on work in the proposal. Commissioner Makras stated that with a defined goal and a set amount of money mandated to do a report we should try to get a complete report and proceed from that.

Motion made by Commissioner Normandy, seconded by Commissioner Berman, to adopt Item 10; carried (4-0) by unanimous vote.

Resolution No. 96-0056: Authorizing the General Manager of Public Utilities to solicit qualifications and proposals from qualified consulting firms to assist in conducting a preliminary study of municipalizing the electric utility system in the City & County of San Francisco.

11. Declaring an emergency and requesting approval of a supplemental appropriation for emergency repair of the Hetch Hetchy Access Road.

Motion made by Commissioner Makras, seconded by Commissioner Berman, to adopt Item 11; carried (4-0) by unanimous vote.

Resolution No. 96-0057: Ratifying the declaration of emergency and requesting the Mayor to recommend to the Board of Supervisors to approve a supplemental appropriation in the amount of

$1,000,000 for emergency measures to repair the Hetch Hetchy Access Road.

12. Amending the policy on the use of the mail insert program.

Motion made by Commissioner Normandy, seconded by Commissioner Makras, to adopt Item 12; carried (4-0) by unanimous vote.

Resolution No. 96-0058: Amending Public Utilities Commission Policy Number WD 2.11 concerning the use of the San Francisco Water Department mail insert program.

13. Accepting the work performed under San Francisco Water Department Contract No. WD-2116.

Motion made by Commissioner Berman, seconded by Commissioner Normandy, to adopt Item 13; carried (4-0) by unanimous vote.

Resolution No. 96-0059: Accepting the work performed under San Francisco Water Department Contract No. WD-2116, 16-Inch Ductile Iron Main Installation in Valencia Street between 14th and 17th Streets, as satisfactorily completed; approving the final contract modification in the debit amount of $9,004; and authorizing final payment in the amount of $13,166.70 to the contractor, P&J Utility Co.

14. Rejecting all bids received for Hetch Hetchy Contract No. HH-839; approving the revised plans and specifications; and authorizing bid call for Hetch Hetchy Contract No. HH-839R, San Joaquin Pipelines Crossover.

Motion made by Commissioner Normandy, seconded by Commissioner Makras, to adopt Item 14; carried (4-0) by unanimous vote.

Resolution No. 96-0060: Rejecting all bids received for Hetch Hetchy Contract No. HH-839; approving the revised plans and specifications; and authorizing bid call for Hetch Hetchy Contract No. HH-839R, San Joaquin Pipelines Crossover.

15. Awarding Hetch Hetchy Water and Power Contract No. HH-853, Tuolumne Meadows Sewer Rehab - Phase II.

Richard Stromberg, attorney for A. Ruiz Construction Co. & Associates, Inc., protested the award of the contract to Ford Construction Company, Inc. Mr. Stromberg stated that Ford Construction Company failed to comply with the bid requirement to submit a bid schedule and that it should be sufficient cause for rejection of their bid. He said Ford Construction Company submitted a work plan detail instead of a bid schedule. He presented copies of both documents to the Commission. The Ruiz bid schedule was a bar chart listing 60-70% activities. The Ford document listed six activities. Chris Cox, Deputy City Attorney, stated that the work plan submitted by Ford Construction Company functioned as a bid schedule. Replying to Commissioner Makras' inquiry, Mr. Hintze stated that there was a difference between a work plan detail and a bid schedule. He said that although Ford Construction used a different form, it served as a bid schedule. Commissioner Berman stated that it appeared that our staff took liberty to interpret what they thought someone was doing.

Fred Paulsen, District Engineer for Ford Construction Co., Inc., stated that they have submitted a schedule that reflected the bid requirement.

Commissioner Makras made a motion to find that Ford Construction Co. was not responsive and

award the contract to Ruiz. Mr. Hintze said that staff had not reviewed A. Ruiz' bids as to compliance with MBE/WBE contract requirements. Bayard Fong, Contract Compliance Officer, stated that he had not reviewed A. Ruiz' MBE/WBE packet. Motion failed for lack of a second.

Commissioner Makras made a motion that based on testimony from staff and evidence presented, Ford Construction was found non responsive and that the bid of A. Ruiz Construction Co. & Associates, Inc. is accepted subject to approval by staff, the Human Rights Commission and all necessary approvals. Commissioner Normandy seconded. Motion carried (4-0) by unanimous vote.

Resolution No. 96-0061: Awarding Hetch Hetchy Water and Power Contract No. HH-853, Tuolumne Meadows Sewer Rehab - Phase II in the amount of $2,862,545 to the second low bidder, A. Ruiz Construction Co. & Associates, Inc., subject to favorable review of bid documents by staff of the Public Utilities Commission and the Human Rights Commission.

16. Authorizing a lease agreement with Emmett Construction Co., Inc.

Motion made by Commissioner Makras, seconded by Commissioner Berman, to adopt Item 16; carried (4-0) by unanimous vote.

Resolution No. 96-0062: Authorizing the General Manager of Public Utilities to execute a lease agreement with Emmett Construction Co., Inc. for .09 acres of Water Department land located at 7835 Enterprise Drive, Newark, California, for use in storing construction materials for the term commencing February 1, 1996 and terminating January 31, 2001 at a rental rate of $125.00 per month.

16.a. Authorizing a new revised permit to Bay Area Rapid Transit District (BART) for geotechnical investigation, soil boring, potholing and surveying along the former Muni right-of-way in San Mateo County.

Motion made by Commissioner Berman, seconded by Commissioner Makras, to adopt Item 16.a.; carried (4-0) by unanimous vote.

Resolution No. 96-0063: Revoking the permit approved by Resolution No. 95-0209 on November 14, 1995; approving the terms and conditions; and authorizing the General Manager of Public Utilities to execute a new revised permit to Bay Area Rapid Transit District (BART) as permittee, for the purpose of geotechnical investigation, soil boring, potholing and surveying along the former Muni right-of-way located in San Mateo County, on a month-to-month tenancy commencing upon authorization and approval of said permit by the Public Utilities Commission and expiring December 31, 1996, for a one-time non-refundable permit fee in the amount of $3,250.00 to cover the City's processing, inspection and other administrative costs.

17. Approving the provisional and temporary appointments and removals made by the General Manager of Public Utilities.

Motion made by Commissioner Berman, seconded by Commissioner Normandy, to adopt Item 17; carried (4-0) by unanimous vote.

Resolution No. 96-0064: Ratifying and approving the provisional and temporary appointments and removals made by the General Manager of Public Utilities for the months of March 1995 through February 1996.

18. Civil Service Policy on Employment of Persons with Disabilities. Motion made by Commissioner Normandy, seconded by Commissioner Makras, to adopt Item 18; carried (4-0) by unanimous vote.

Resolution No. 96-0065: Affirming support and endorsement of the Civil Service Policy on Employment of Persons with Disabilities.

CLOSED SESSION

19. Public Comments on matters to be discussed in Closed Session.

There were no public comments.

The Public Utilities Commission met in Closed Session from 2:44 p.m. to 4:10 p.m. to discuss the following matters:

20. Conference with Legal Counsel - Pursuant to Government Code Section 54956.9(a):

Existing Litigation: Dorothy Ogden v. CCSF, Alameda County Superior Court No. H-166880-9

Motion made by Commissioner Makras, seconded by Commissioner Normandy, to adopt Item 20; carried (4-0) by unanimous vote.

Resolution No. 96-0066: Approving a settlement of claim in the case of Dorothy Ogden v. CCSF, Alameda County Superior Court No. H-166880-9.

21. Conference with Legal Counsel - Pursuant to Government Code Section 54956.9(b)(c):

Anticipated Litigation: As Plaintiff and as Defendant Regarding 500+ acres of San Francisco Water Department property on Bernal Avenue in Alameda County.

No action was taken.

22. Conference with Legal Counsel - Pursuant to Government Code Section 54956.9(a): Existing Litigation: Chevron v. CCSF, and CCSF v. Standard, et.al. (Chevron).

No action was taken.

23. Announcement following Closed Session.

Romaine A. Boldridge, Commission Secretary, announced the actions taken by the Commission during the Closed Session.

24. Motion regarding whether to disclose the discussions during Closed Session.

Moved by Commissioner Normandy, seconded by Commissioner Berman, not to disclose the discussion during the Closed Session; carried (4-0) by unanimous vote.

Thereupon, the meeting was adjourned: 4:12 p.m.

Romaine A. Boldridge Secretary

City Departments Information Center Community Resources

©1997, 1998 City & County of San Francisco

06/03/1998

MINUTES

PUBLIC UTILITIES COMMISSION

CITY AND COUNTY OF SAN FRANCISCO

Willie L. Brown, Jr. MAYOR

REGULAR MEETING

April 9, 1996 1:00 P.M. Room 402 1155 Market Street, Fourth Floor

COMMISSIONERS

Marion E. Otsea, President

E. Dennis Normandy

Robert K. Werbe

Victor G. Makras

DEPARTMENTS BUREAUS

Water Department Commercial Land Management

Hetch Hetchy Engineering and Construction Management

Finance

Information Systems

Personnel and Training

System Planning and Regulatory Compliance

Anson B. Moran

GENERAL MANAGER

Romaine A. Boldridge

SECRETARY

1. CALL TO ORDER: 1:05 p.m.

2. ROLL CALL: Present - President Marion E. Otsea, Commissioner E. Dennis Normandy, Commissioner Victor G. Makras

Excused - Commissioner Robert K. Werbe

Note: Commissioner Henry E. Berman resigned effective March 29, 1996. A replacement has not

been appointed as of today's meeting.

3. APPROVAL OF MINUTES

There were no minutes submitted for approval.

4. COMMUNICATIONS

No action was taken.

5. INTRODUCTION OF OLD BUSINESS BY COMMISSIONERS

There was none.

6. INTRODUCTION OF NEW BUSINESS BY COMMISSIONERS

Commissioner Makras suggested putting an item on the calendar for discussion of why, and how the Water Department puts liens on buildings. He said he had received a number of complaints from property owners in San Francisco about huge liens they pay on their tax bills for delinquent water charges accrued by tenants. John Mullane, General Manager, Water Department, stated that the department staff also received calls from property owners aggravated by liens imposed on their properties and not being able to control their tenants' water consumption. Mr. Mullane stated that the Board of Supervisors passed an ordinance in 1978 that gave the Water Department authority to impose liens for delinquent water and sewer bills. Before this is done, the Water Department notifies the owner or customer of the delinquency and the potential for placing a lien on the property if they do not pay the overdue amount in 15 days. If payment is not received, they again notify the owner to appear before the Lien Committee to protest the lien. If the owner does not pay the lien placed on the property by the end of the fiscal year, it is referred to the Tax Collector to prepare a special tax assessment and if is still unpaid at the end of five years, the Tax Collector could sell the property to collect the money. Mr. Mullane stated that the City Attorney advised that it was within the Water Department's purview to simultaneously implement the lien process and terminate water service in commercial buildings occupied by tenants. Mr. Mullane said the Water Department would begin implementing the policy of terminating water service on commercial properties with delinquent water bills. Commissioner Makras indicated that the explanation given by Mr. Mullane was satisfactory. He suggested sending an announcement advising property owners about the policy.

7. REPORT OF THE GENERAL MANAGER

Anson B. Moran, General Manager, conveyed a message from former Commissioner Henry E. Berman thanking the members of the Commission and staff for their work while he served as a Commissioner on the PUC.

Mr. Moran stated that a letter was received from Senator Quentin Kopp requesting reconsideration of the Commission's action regarding the Millbrae Grade Separation Project. Since none of the Commissioners have requested that the matter be recalendared, Mr. Moran suggested writing a reply to Senator Kopp stating that the matter will not be calendared for reconsideration but he is welcome to address the Commission.

Lawrence T. Klein, General Manager, Hetch Hetchy Water & Power reported that in two weeks utility agencies in California will hold collaborative discussions regarding the implementation of the plan to restructure the electric industry. He said that staff would provide an update to the

Commission on the result of this discussion.

8. PUBLIC COMMENTS

There were none.

Items were taken out of order. Items 9, 10 and 11 were moved to the end of the calendar.

12. Accepting the work performed under Hetch Hetchy Contract No. HH-848(E), Early Intake Access Road Stabilization.

Motion made by Commissioner Normandy, seconded by Commissioner Makras to adopt Item 12; carried (3-0) by unanimous vote.

Resolution No. 96-0067: Accepting the work performed under Hetch Hetchy Contract No. HH-848(E), Early Intake Access Road Stabilization, as completed; approving final contract modification No. 1 in the credit amount of $36,448.92; and authorizing final payment to the contractor, Schnable Foundation Company, in the amount of $5,847.89.

13. Approving a fee increase paid to payment stations for collection of water and sewer service charges.

Motion made by Commissioner Makras, seconded by Commissioner Normandy to continue Item13 to April 23, 1996; carried (3-0) by unanimous vote.

14. Authorizing the General Manager of Public Utilities to execute the 1996 WARN Omnibus Mutual Aid Agreement.

John Mullane, General Manager, Water Department, advised that the resolution should be amended to authorize the PUC to transmit the agreement to the Board of Supervisors for approval.

Motion made by Commissioner Normandy, seconded by Commissioner Makras to adopt Item 14 as amended; carried (3-0) by unanimous vote.

Resolution No. 96-0068: Authorizing the General Manager of Public Utilities to execute the 1996 WARN Omnibus Mutual Aid Agreement amendment governing procedures for mutual assistance between water agencies in time of emergency.

15. Accepting the work performed under San Francisco Water Department Contract No. WD-2117.

Motion made by Commissioner Normandy, seconded by Commissioner Makras to adopt Item 15; carried (3-0) by unanimous vote.

Resolution No. 96-0069: Accepting the work performed under San Francisco Water Department Contract No. WD-2117, 8-Inch Ductile Iron Main Installation in Grant Avenue between Sutter Street and Columbus Avenue and Sewer Line Replacement in Grant Avenue between Washington and Clay Streets, as satisfactorily completed; approving debit contract modification No. 1 in the amount of $19,384.00; and authorizing final payment in the amount of $14,124.00 to the contractor, Shaw Pipeline, Inc.

16. Authorizing the General Manager of Public Utilities to execute an agreement with Linear Options, Inc.

Motion made by Commissioner Makras, seconded by Commissioner Normandy to adopt Item 16; carried (3-0) by unanimous vote.

Resolution No. 96-0070: Authorizing the General Manager of Public Utilities to execute an agreement with Linear Options, Inc., as lessee, for the lease of approximately .244 acres of Water Department land located at One Kelly Court in Menlo Park, CA for parking vehicles and storage of materials on a month-to-month tenancy commencing on April 1, 1996 at a rental rate of $500 per month.

17. Authorizing the General Manager of Public Utilities to execute an agreement with Serra Bowl, Inc.

President Otsea suggested amending the resolution to include information on back rent.

Motion made by Commissioner Makras, seconded by Commissioner Normandy to adopt Item 17 as amended; carried (3-0) by unanimous vote.

Resolution No. 96-0071: Authorizing the General Manager of Public Utilities to execute an agreement with Serra Bowl, Inc., as lessee, for the lease of approximately 1.03 acres of land located at 3301 Junipero Serra Blvd. in Daly City, CA for parking, storage and driveway access for a term commencing on January 1, 1996 and terminating December 31, 2005 at a rental rate of $3,333.33 per month provided that the lessee shall pay $43,099.23 for back rent and real estate taxes due for the period October 1, 1994 through February 29, 1996.

18. Authorizing the execution of a "Memorandum of Understanding of Principles of Agreement for Substitution of Tertiary Recycled Water for Groundwater to Irrigate Golf Courses".

President Otsea directed staff to make it clear to the golf clubs that they must sign the purchase agreement with the City of Daly City by July 1, 1996. Commissioner Makras suggested adding a clause in the MOU that if the clubs do not have the agreement signed by this date and if the City institutes a legal action they should reimburse the City for legal fees. Joshua Milstein, Deputy City Attorney, stated that the legal fees would be astronomical. Commissioner Normandy suggested modifying the resolution to put pressure on the clubs to abide by the agreement. Mr. Milstein suggested instructing the legal counsel or staff to take appropriate action if the clubs do not sign the contract by July 1. The Commission agreed to indicate in the resolution not only for staff to report by July 1 on the progress but also to recommend appropriate action if the contract is not signed.

Motion made by Commissioner Normandy, seconded by Commissioner Makras to adopt Item 18 as amended; carried (3-0) by unanimous vote.

Resolution No. 96-0072: Authorizing the General Manager of Public Utilities to sign the "Memorandum of Understanding of Principles of Agreement for Substitution of Tertiary Recycled Water for Groundwater to Irrigate Golf Courses" with the City of Daly City, the Olympic Club, the Lake Merced Golf and Country Club, and the San Francisco Golf Club; and directing staff to report by July 1, 1996 on progress toward providing recycled water to the golf clubs and directing staff and counsel to recommend appropriate action.

Item 9 and 10 were discussed collectively by the Commission.

9. Public Hearing - To consider a proposal for adopting a revised schedule of rates to be charged by the San Francisco Water Department for water service to retail customers in and outside San

Francisco.

10. Public Hearing - To consider a proposal for adopting a revised schedule of rates to be charged by the San Francisco Water Department for water service to Suburban Wholesale customers.

Timothy Dayonot, Manager, Government & Public Affairs, gave a presentation using electronic media regarding the outreach program he was conducting with organizations having interests in the proposed water rate increase. Mr. Dayonot stated that presentations were made to the Hotel Association, Building Owners and Managers Association, and the Chamber of Commerce. He said there were no formal positions taken by these groups regarding the rate increase. Mr. Moran stated that the hotel association was more interested in changing the rate structure.

William H. Laws, Rate Administrator, gave a presentation using electronic media on the rate objectives, revenue requirement rate analysis, cost allocation to retail and resale customers and how the balancing account affects rates, and staff's recommendation for water rates and miscellaneous fees and charges.

Mr. Moran noted that if there were delays in hiring new employees, he would hire contractors so as not to impede the start of the projects.

Commissioner Makras stated that there would be no need to increase water rates if we reduced the proposed capital improvement program by $5.408 million. He stated that some projects could be phased-in over several years and it would give time for the department to catch up with projects that were already funded but have not been started as of today.

Robert Jacobs, Executive Director of San Francisco Hotel Association, commented that the hotel association was opposed to the proposed increase in water and sewer rates.

Art Jensen, General Manager, Bay Area Water Users Association, commented that they would continue to work with staff regarding capital financing alternatives and long term financing plans. He stated that they are also interested in looking for ways to manage costs paid by suburban customers. Motion made by Commissioner Normandy, seconded by Commissioner Makras to continue Items 9 and 10 to April 23, 1996; carried (3-0) by unanimous vote.

11. To consider adopting the Sunol Valley Resource Management Plan for the San Francisco Water Department.

Mr. Moran recommended that the Commission not take action at this meeting and continue the matter to the next meeting.

David Blau of EDAW, Inc., consultant for the project, showed charts comparing gross mining revenue and usable water storage for Alternatives A, E, and F. He discussed the mining completion for each alternative. Mr. Blau stated that in Alternative A, there would be less storage and less revenue but there would be capabilities of storing water earlier. Mining in Alternative A is phased for completion in years 2001, 2005, 2006. One pit was estimated to be completed between years 2015-2020. The City would acquire 32,000 acre feet in usable storage and produce revenue of $24,500,000 when all mining pits in Alternative A are completed by year 2020. In Alternative E, mining is phased for completion in years 2003 and 2006, and two pits are estimated to be completed in year 2045. Mr. Blau said that in Alternative E there would be mining until the year 2045 with the potential to reclaim 53,100 acre feet for usable water storage. In Alternative F, mining is phased for

completion in years 2003, 2006, 2013, 2021 and 2045.

William Howard, Vice President of Mission Valley Rock, responded positively to Commissioner Makras' question on whether Mission Valley Rock could increase their mining production.

Mort Calvert, an engineer for Mission Valley Rock, commented that findings based on the environmental study approved by Alameda County indicated that there would be no significant impact on the Sunol temple with the 630 ft. set back in Alternative E.

James Sorensen, Head of Development Planning Division of Alameda County, commented that the combination of Alternative E, maximizing storage north of the freeway, and Alternative F, maximizing storage south of the freeway, would be Alameda County's preferred alternative as it could accomplish the objectives of the Water Department and the County of Alameda.

Mr. Moran proposed a sequence that goes first to mining on the existing pit south of the freeway then on the north of the freeway (the big footprint for mining) with reclamation to Alternative F, and adopt two alternatives south of the freeway, one recognizing existing permits and the other recognizing more aggressive mining in that area. He said this sequence would best serve the City's interests in revenue and water storage capabilities and the concerns around the Sunol temple site. Mr. Sorensen stated that this proposal would also be acceptable.

Motion made by Commissioner Normandy, seconded by Commissioner Makras to reopen the public hearing; carried (3-0) by unanimous vote. President Otsea reopened the public hearing.

Patricia Stillman, President, Save our Sunol, commented that the impact to the Sunol community of quarrying was not mentioned in any of the discussion. She urged that the Commission consider their concerns regarding the noise, air pollution and effects to property values if quarrying is permitted in the area.

Bart Stillman, commented that the people in Sunol were not being consulted properly on this project. He stated that the Environmental Impact Report on Surface Mining Permit 32 was incomplete and that their association, Save Our Sunol, had sued the County of Alameda regarding approval of the permit.

On motion made by Commissioner Normandy, seconded by Commissioner Makras, the public hearing was closed; carried (3-0) unanimously.

Commissioner Normandy suggested looking at time lines relative to Alternatives E and F and identify "who, what, and when" would be affected by its adoption. He said it would enable the Commission to make decisions beneficial to the City, the citizens of Sunol and the vendors with whom the City is dealing. Motion made by Commissioner Normandy, seconded by Commissioner Makras to continue Item 11 to May 14, 1996; carried (3-0) by unanimous vote.

CLOSED SESSION

19. Public Comments on matters to be discussed in Closed Session.

The Public Utilities Commission met in closed session from 4:00 p.m. to 5:25 p.m. to discuss the following matters:

20. Conference with Legal Counsel - Pursuant to Government Code Section 54956.9(a):

Existing Litigation: Chevron v. CCSF, and CCSF v. Standard, et.al. (Chevron).

Motion made by Commissioner Makras, seconded by Commissioner Normandy to issue a permit for Item 20; carried (3-0) by unanimous vote.

Resolution No. 96-0073: Authorizing the General Manager of Public Utilities to issue and execute any permits required to assess the impacts of the existing Chevron Bay Area Products Pipeline located near the San Antonio Reservoir to Chevron Pipeline Company or their affiliates.

21. Conference with Legal Counsel - Pursuant to Government Code Section 54956.9(b)(c):

Anticipated Litigation: As Plaintiff and as Defendant Regarding 500+ acres of San Francisco Water Department property on Bernal Avenue in Alameda County.

No action was taken by the Commission on Item 21.

22. Conference with Legal Counsel - Pursuant to Government Code Section 54956.9(b)(c):

Anticipated Litigation: As Defendant Claimant: Robin Bauer

Motion made by Commissioner Normandy, seconded by Commissioner Makras, to approve a settlement for Item 22; carried (3-0) by unanimous vote.

Resolution No. 96-0074: Approving a settlement of claim for Robin Bauer.

23. Conference with Legal Counsel - Pursuant to Government Code Section 54956.9(b)(c):

Anticipated Litigation: As Defendant Claimant: Norman Hoo/United Auto Repair

Item 23 was removed from the calendar.

24. Conference with Legal Counsel - Pursuant to Government Code Section 54956.9(b)(c):

Anticipated Litigation: As Defendant Claimant: Pacific Gas & Electric

Moved by Commissioner Makras, seconded by Commissioner Normandy to approve a settlement for Item 24; carried (3-0) by unanimous vote:

Resolution No. 96-0075: Approving a settlement of claim for Pacific Gas & Electric.

25. Conference with Legal Counsel - Pursuant to Government Code Section 54956.9(a):

Existing Litigation: City and County of San Francisco v. Crystal Springs Golf Club, Inc.

Moved by Commissioner Normandy, seconded by Commissioner Makras to authorize an agreement with Crystal Springs Golf Club, Inc. to pay $5,000 for underground tank removal.

Resolution No. 96-0076: Authorizing the General Manager of Public Utilities to execute an agreement with Crystal Springs Golf Club, Inc. obligating the City to contribute one half of the cost of the removal of underground fuel storage tanks on the premises up to $10,000, such that the City's maximum contribution would be $5,000.

26. Announcement following Closed Session.

The Commission reconvened in open session at 5:25 p.m. Romaine A. Boldridge, Commission Secretary, announced the actions taken by the Commission.

27. Motion regarding whether to disclose the discussions during Closed Session.

Moved by Commissioner Normandy, seconded by Commissioner Makras, not to disclose the discussions during Closed Session; carried (3-0) by unanimous vote.

Thereupon, the meeting was adjourned: 5:27 p.m.

Romaine A. Boldridge Secretary

City Departments Information Center Community Resources

©1997, 1998 City & County of San Francisco
06/03/1998

MINUTES

PUBLIC UTILITIES COMMISSION

CITY AND COUNTY OF SAN FRANCISCO

Willie L. Brown, Jr. MAYOR

REGULAR MEETING

May 14, 1996 1:00 P.M. Room 402 1155 Market Street, Fourth Floor

COMMISSIONERS

Marion E. Otsea, President

E. Dennis Normandy

Robert K. Werbe

Victor G. Makras

DEPARTMENTS BUREAUS

Water Department Commercial Land Management

Hetch Hetchy Engineering and Construction Management

Finance

Information Systems

Personnel and Training

System Planning and Regulatory Compliance

Anson B. Moran

GENERAL MANAGER

Romaine A. Boldridge

SECRETARY

1. CALL TO ORDER: 1:05 p.m.

2. ROLL CALL: Present - President Marion E. Otsea, Commissioner E. Dennis Normandy, Commissioner Robert K. Werbe

Excused - Commissioner Victor G. Makras

3. APPROVAL OF MINUTES

On motion by Commissioner Werbe, seconded by Commissioner Normandy, the Minutes of the Regular Meetings of April 9, 1996 and April 23, 1996 were approved (3-0) by unanimous vote.

4. COMMUNICATIONS

No action was taken.

5. INTRODUCTION OF OLD BUSINESS BY COMMISSIONERS

There was no old business introduced by Commissioners.

6. INTRODUCTION OF NEW BUSINESS BY COMMISSIONERS

There was no new business introduced by Commissioners.

7. REPORT OF THE GENERAL MANAGER

There was none.

8. PUBLIC COMMENTS

Ruth Brinker, Fresh Organic Farms Project, requested that if there were any surplus lands for sale by the department that they be turned over to Fresh Start Farm. Anson B. Moran stated that staff intends to report to the Commission regarding recommendations for surplus properties.

The agenda was taken out of order. The minutes reflect the order in which agenda items were taken by the Commission.

21. Designating a date to conduct a public hearing to consider proposals for rate adjustments for water service and water supplied by the San Francisco Water Department.

Motion made by Commissioner Normandy, seconded by Commissioner Werbe to adopt Item 21; carried (3-0) by unanimous vote:

Resolution No. 96-0098: Designating May 28, 1996 at 1:00 p.m. at 1155 Market Street, San Francisco, California as the date, time and place to conduct a public hearing to consider proposals for rate adjustments for water service and water supplied by the San Francisco Water Department for its retail and wholesale customers and fee adjustments for various permits and services.

22. Authorizing issuance of a permit to Sandra Lee Sheffield.

Robin Eickman, Director of the San Francisco Film Commission, expressed concerns about the length of time it took for the permit to get approved and the permit fee required. She stated that the Film Commission waives fees for nonprofit organizations or students when they are filming in the City. Mr. Moran stated that staff would inform the Film Commission of PUC's permit issuance procedure and fees.

Motion made by Commissioner Werbe, seconded by Commissioner Normandy to adopt Item 22; carried (3-0) by unanimous vote:

Resolution No. 96-0099: Authorizing the General Manager of Public Utilities to execute a permit with Sandra Lee Sheffield to conduct still photography, collect materials for an audio soundtrack and

operate a six-person film crew on Water Department lands commencing upon execution following PUC approval and expiring upon oral or written notice from the City for a permit processing fee of $750.00.

17. Authorizing the issuance of up to $145 million of Water Department bonds.

Steven Carmichael, Director, Bureau of Finance, stated that the approval of the Third Supplemental Indenture was necessary due to the new Charter going into effect on July 1, 1996. He said the new Charter eliminated the wording that allows PUC to issue debt financing under the same indenture agreements upon which existing PUC bonds were based. The indenture would affirm that language and allow PUC to go out for debt issues for the next fiscal year without having to get approval of the Board of Supervisors and without amending the Charter. He said there would be no Charter amendment proposals on the ballot for the next election. The resolution also authorizes the issuance of $145 million water bonds; $70 million of which is for refinancing of bonds and $75 million for repair and replacement bonds for facilities and other items required by state and federal mandate.

Motion made by Commissioner Werbe, seconded by Commissioner Normandy to adopt Item 17; carried (3-0) by unanimous vote:

Resolution No. 96-0096: Authorizing the execution of Third Supplemental Indenture, affirming the application of San Francisco Charter Section 6-407-1 to outstanding Water Department bonds; authorizing the issuance of up to $145 million of Water Department bonds for repair and/or replacement of existing Water Department facilities, construction of facilities, and refunding of all or part of the 1991 Series A bonds.

18. Approving the proposed Charter Amendment which will establish separate revenue funds for the Water Department and Hetch Hetchy for the deposit of revenues generated from the Water Department and Hetch Hetchy, respectively; and provide priority schedules for expenditures paid from these two funds.

Item 18 was removed from the calendar.

President Otsea removed Items numbered 10, 10.a., 13, 14, 16, 19 and 26 from the Regular Calendar for consideration as Consent Calendar items.

Motion made by Commissioner Normandy, seconded by Commissioner Werbe to adopt Items 9.a. 10, 10.a., 13, 14, 16, 19 and 26; carried (3-0) by unanimous vote:

9.a. Resolution No. 96-0087: Approving collection of charges for damages against the San Francisco Water Department in the amount of $4,210.34 and the Bureau of Light, Heat and Power in the amount of $1,235.93 for the months of January, February, and March 1996.

10. Resolution No. 96-0088: Authorizing the General Manager of Public Utilities to negotiate a modification to the agreement with Martha H. Lennihan to assist the City Attorney's Office on Central Valley Policy Improvement Act (CVPIA) and water transfer related matters, extending the contract to December 31, 1997 at a cost not to exceed $80,000.

10.a. Resolution No. 96-0089: Setting June 18, 1996 at 1:00 p.m. at 1155 Market Street, San Francisco, California as the date, time and place for a public hearing to consider findings of fact and judgment relating to the transfer of funds from Hetch Hetchy Water and Power to the General Fund.

13. Resolution No. 96-0092: Authorizing the General Manager of Public Utilities to transfer $500,000 from "Taxes, Licenses, and Permits" to "Materials & Supplies" in the Water Supply and Treatment Division's operating fund.

14. Resolution No. 96-0093: Requesting approval to solicit and advertise for Request for Proposals for EDP professional services to implement the Hewlett Packard ChemLMS Laboratory Information Management System (LIMS) and Bar Coding.

16. Resolution No. 96-0095: Approving the final plans and specifications and authorizing bid call for San Francisco Water Department Contract No. WD-2198, Town of Sunol Water System Improvements.

19. Resolution No. 96-0097: Authorizing the General Manager of Public Utilities to transfer $230,000 in the Water Department's Operating Budget from "Other Current Expenses" to "Services of Other Departments" to increase the funds work ordered to the City Attorney's Office for outside legal services related to arbitration proceeding with the Suburban Purchasers.

26. Resolution No. 96-0103: Approving the San Francisco Water Department's participation in a regional waterborne disease surveillance program with the Western Consortium for Public Health.

12. Authorizing the development of a managed access program for PUC's Right of Way.

Eric Kellers, a resident of Redwood City, commented that he was opposed to closing the right of way on St. Francis Street.

Michael McCracken, representing Mr. and Mrs. Brazil, commented that his client's property was rendered unmarketable due to their garage encroaching into the Water Department's Right of Way. He requested that PUC grant an annual renewable license to his client as a form of easement to recognize the existence of their garage. He said it would help the Brazils sell or refinance their property.

Mr. Moran pointed out that Mr. and Mrs. Brazil's case was an encroachment permit and the item before the Commission was intended for right-of-way access. He suggested deferring action on the Brazil's request for the next Commission meeting to allow staff time to review the matter further.

Mr. Moran explained that the proposed resolution directs staff to develop a managed access program for the right of way and directs staff to come back to the Commission with a proposal that would provide Mr. and Mrs. Larry Knight limited access to their property while that program is being developed. Staff will come back at the next meeting with a specific proposal for the Knight's.

Motion made by Commissioner Normandy, seconded by Commissioner Werbe, to adopt Item 12; carried (3-0) by unanimous vote:

Resolution No. 96-0091: Authorizing the development of a managed access program for PUC's Right of Way, a specific plan for interim management of the Quartz Avenue Right of Way property in Redwood City, and the development of a fee structure for Right of Way access permits and short term permits.

15. Approving Contract Modification No. 1A and Contract Modification No. 2A to the contract with A. Ruiz Construction Co., & Associates, Inc., Hetch Hetchy Water and Power Contract HH-837.

Motion made by Commissioner Werbe, seconded by Commissioner Normandy to adopt Item 15; carried (3-0) by unanimous vote:

Resolution No. 96-0094: Approving Contract Modification No. 1A and Contract Modification No. 2A to the contract with A. Ruiz Construction Co., & Associates, Inc., Hetch Hetchy Water and Power Contract HH-837, Moccasin Penstock Anchor Repair, in the amount of $213,134.00 and $100,930.91 respectively; approving a fund transfer of $314,065.00 from "Tunnel and Pipeline to Alameda-Repairs" Project to "Moccasin Penstock Anchor Repair" Project; and requesting the Mayor to recommend to the Board of Supervisors a request for supplemental appropriation of $100,930.91 to fund Contract Modification No. 2A.

25. Authorizing an agreement with Carollo Engineers/AGS, Inc. to provide professional engineering services.

Motion made by Commissioner Werbe, seconded by Commissioner Normandy to adopt Item 25; carried (3-0) by unanimous vote:

Resolution No. 96-0102: Authorizing the General Manager of Public Utilities to negotiate and execute an agreement with Carollo Engineers/AGS, Inc., a joint venture, to provide professional engineering services to identify and prioritize improvements needed at the Sunol Valley Water Treatment Plant, for a contract amount not to exceed $150,000 for a term of four months.

23. Authorizing the General Manager of Public Utilities to execute a lease with Bay Area Cellular Telephone Company.

Motion made by Commissioner Normandy, seconded by Commissioner Werbe to adopt Item 23; carried (3-0) by unanimous vote:

Resolution No. 96-0100: Authorizing the General Manager of Public Utilities to execute a lease with Bay Area Cellular Telephone Company, for approximately 360 square feet of building space as well as access to the site and common areas via an access roadway on a portion of Parcel 65 of Sunol and San Antonio Lands in Alameda County, for use as communication site for cellular telephone operational uses for a term of ten years commencing on May 1, 1996 and terminating April 30, 2006 at a rental rate of $1,500.00 per month.

24. Authorizing the General Manager of Public Utilities to execute a lease with GTE Mobilnet of California Limited Partnership.

Motion made by Commissioner Normandy, seconded by Commissioner Werbe to adopt Item 24; carried (3-0) by unanimous vote:

Resolution No. 96-0101: Authorizing the General Manager of Public Utilities to execute a lease with GTE Mobilnet of California Limited Partnership, for approximately 360 square feet of building space as well as access to the site and common areas via an access roadway on a portion of Parcel 65 of Sunol and San Antonio Lands in Alameda County, for use as communication site for cellular telephone operational uses for a term of ten years commencing on May 1, 1996 and terminating April 30, 2006 at a rental rate of $1,500.00 per month.

20. Informational item regarding office space requirements.

Steven Carmichael, Director, Bureau of Finance, requested direction from the Commission on how

to proceed with the office space requirements of staff at the Water Department, the Bureau of Finance and the Bureau of Management Information Systems (BMIS). Staff of the Water Department and the Bureau of Finance are currently housed at 425 Mason Street and BMIS at 414 Mason Street. Mr. Carmichael suggested that with the Municipal Railway vacating its offices at 1155 Market Street, PUC could lease that space and move the staff at 425 Mason and 414 Mason Streets into the vacated space. Mr. Moran said that this action would consolidate all PUC staff in one location, reduce office space costs and eventually could lead to the sale of the 425 Mason Street building. Mr. Carmichael stated that if we enter into a long term lease for 1155 Market Street we could obtain tenant improvements as well. The Commission expressed approval of the direction staff was taking to move staff from Mason Street to Market Street.

Commissioner Werbe directed staff to confer with him and Commissioner Makras before negotiating the lease with the landlord of the building.

No action was taken as Item 10 was an informational item only.

11. To consider adopting the Sunol Valley Management Plan.

Staff proposed the following direction for managing the water resources in the Sunol Valley: North of Freeway I-680, mine for gravel extraction as described in Alternative E and restore and manage the area as described in Alternative F, including landscape and recreation plans that provide for the restoration of the Sunol Water Temple, its historic entry, and public use of the temple area which are to be jointly approved by the General Manager of the Public Utilities Commission and Alameda County, and then restored at the completion of mining. South of Freeway I-680, mine for gravel extraction and manage as described in Alternative F.

Mr. Moran suggested an amendment to include two identified alternatives for south of the freeway, one is essentially according to existing permit alignment and the second presumes modification to those permits. Ed Stewart, Manager, Watershed Management Division, suggested that the option should specify mining to a depth of 200 feet within currently permitted areas.

Robert Frillman requested the Commissioners not to approve the modified plan for Alternatives E and F. He said there are other alternatives where the City & County of San Francisco can maximize its revenues like expanded quarrying south of the freeway. The existing Permit SMP 29 that Mission Valley Rock has north of the freeway would allow them to mine the aggregate that they expect to mine there and leave the area around the Sunol Temple in its current state.

Motion made by Commissioner Werbe, seconded by Commissioner Normandy to adopt Item 11 as amended; carried (3-0) by unanimous vote:

Resolution No. 96-0090: Adopting the following general direction for managing the resources in the Sunol Valley: North of Freeway I-680, mine for gravel extraction as described in Alternative E and restore and manage the area as described in Alternative F, including landscape and recreation plans that provide for the restoration of the Sunol Water Temple, its historic entry, and public use of the temple area which are to be jointly approved by the General Manager of the Public Utilities Commission and Alameda County, and then restored at the completion of mining. South of Freeway I-680 two options are hereby identified: Option 1 is to mine for gravel extraction and restore and manage the area as described in Alternative F; Option 2 is to mine for gravel extraction within the currently permitted areas to a depth of 200 feet and restore and manage the area as described in Alternative F; authorizing the General Manager of the Public Utilities Commission to incorporate the

above modified version of Alternative F into the Watershed Planning Project, consistent with the original elements of the Preferred Alternative of the Comprehensive Watershed Management Policy and Plans, and proceed with the preparation of draft watershed management plans and environmental review according to the California Environmental Quality Act.

CLOSED SESSION

27. Public Comments on matters to be discussed in Closed Session.

There were none.

The Public Utilities Commission met in Closed Session from 2:05 p.m. to 2:20 p.m. at which time Commissioner Werbe was excused and the Commission lost its quorum.

28. Conference with Legal Counsel - Pursuant to Government Code Section 54956.9(b)(c):

Anticipated Litigation: As Plaintiff and as Defendant Regarding 500+ acres of San Francisco Water Department property on Bernal Avenue in Alameda County.

No action was taken.

29. Conference with Legal Counsel - Pursuant to Government Code Section 54956.9(a):

Existing Litigation: Martin & Topolos v. SFWD, et.al., Superior Court No. 965-597.

Item 29 was not discussed.

30. Conference with Legal Counsel - Pursuant to Government Code Section 54956.9(a):

Existing Litigation: Chevron v. CCSF, and CCSF v. Standard, et.al. (Chevron).

No action was taken.

31. Conference with Legal Counsel - Pursuant to Government Code Section 54956.9(b)(c):

Anticipated Litigation: As Plaintiff Regarding Terri Rasmussen dba Skyline Stables.

Item 31 was not discussed.

32. Conference with Legal Counsel - Pursuant to Government Code Section 54956.9(b)(c):

Anticipated Litigation: As Plaintiff Regarding San Joaquin Tributaries Association vs. State Water Resources Control Board.

Motion made by Commissioner Werbe, seconded by Commissioner Normandy to authorize signing of Letter of Intent; carried (3-0) by unanimous vote:

Resolution No. 96-0104: Directing the General Manager of Public Utilities to endorse the Letter of Intent regarding the proposed program to implement the San Joaquin provisions in the Bay-Delta Accord and participate with other signatories to the Letter of Intent and other stakeholders to achieve an Implementation Agreement which will implement the Accord in a manner which will provide protection for the Delta, meet the water supply needs of San Joaquin basin water users and protect San Francisco's water rights.

33. Conference with Legal Counsel - Pursuant to Government Code Section 54956.9(b)(c):

Anticipated Litigation: As Defendant Claimant: Norman Hoo/United Auto Repair

Motion made by Commissioner Werbe, seconded by Commissioner Normandy to approve a settlement for Item 33; carried (3-0) by unanimous vote:

Resolution No. 96-0105: Approving settlement of claim in the case of Norman Hoo/United Auto Repair.

34. Announcement following Closed Session.

The announcement was postponed until the next meeting due to lack of a quorum.

35. Motion regarding whether to disclose the discussions during Closed Session.

No action was taken due to lack of a quorum.

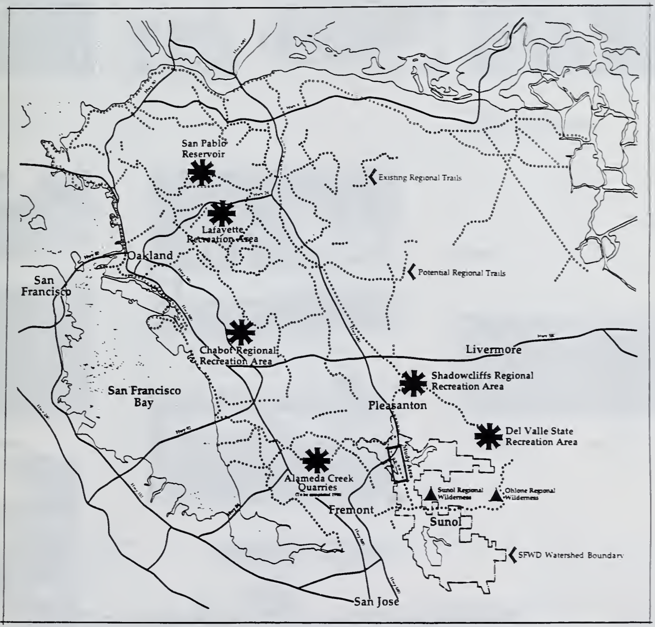
Thereupon, the meeting was adjourned: 3:40 p.m.

Romaine A. Boldridge Secretary

City Departments Information Center Community Resources

©1997, 1998 City & County of San Francisco

06/03/1998



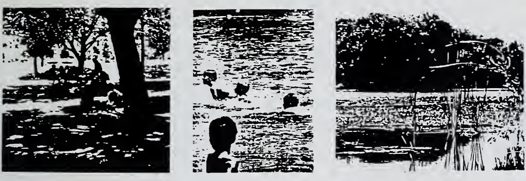
Regional Recreation

San Francisco Water Department • San Francisco Watershed Management Plans

Sunol Valley Resources Management Element

10,240 acres

EDAW, I

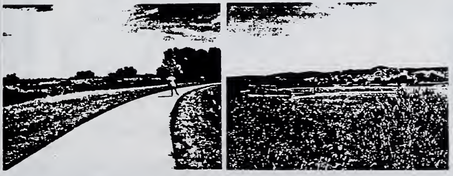


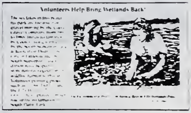
Shadowcliffs Regional
Recreation Area
Livermore, California

Buchard Gardens
Victoria, British Columbia

Thornton Pits
Thornton, Colorado

Tuolumne River
Stanislaus County, California

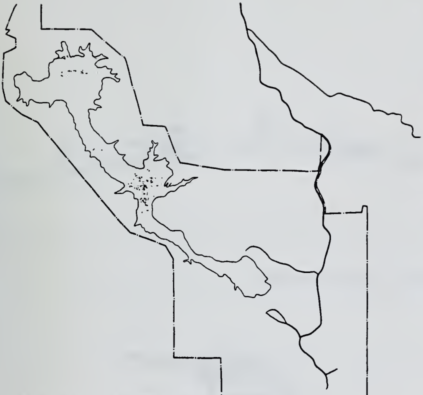




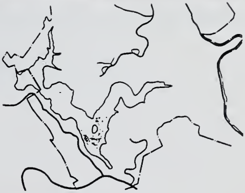
Volunteers Help Bring Wetlands Back

Cooley Pits
South Platte River
Littleton, Colorado

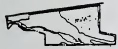
Is It Possible to Convert a Gravel Quarry to Water Storage and a Recreation Amenity?
Some Successful Examples



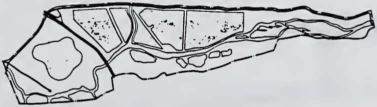
Lake Del Valle State Recreation Area



Lake Chabot Regional Park



Shadowcliffs Regional Recreation Area

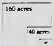


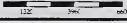
Sunol Valley

Comparable Scales

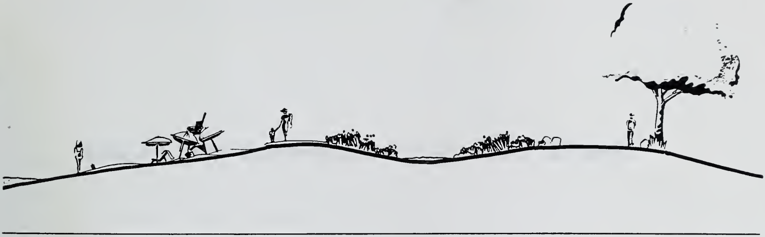
San Francisco Water Department • San Francisco Watershed Management Plans

Sunol Valley Resources Management Element

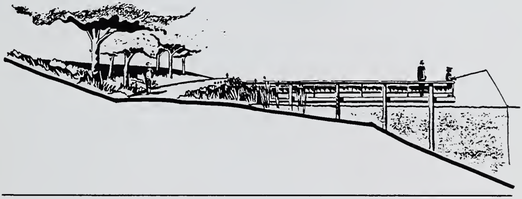




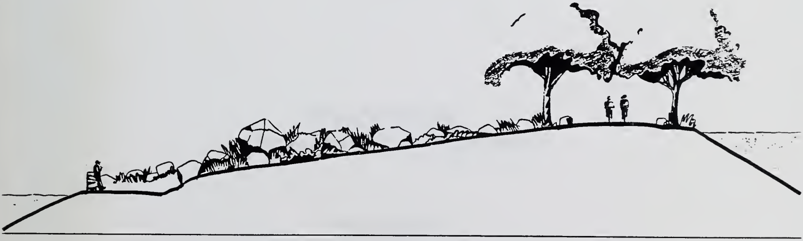
EDAW, Inc



Section through Beach Area



Section through Fishing Pier



Section through Water's Edge Trail

Representative Sections

EDAW, Inc

Sunol Valley Resources Management Element

Draft Public Involvement Summary Report

Prepared for the
San Francisco Water Department

Prepared by
Public Affairs Management
and EDAW, Inc.

TABLE OF CONTENTS

I. Introduction

A. Study Background and Overview 1
B. Report on the Agency Workshops and Community Meetings 1
C. Report on the Spring 1996 SFPUC Public Meetings 2

II. Summary of Comments 3

A. June 29, 1995 Agency Workshop & Community Meeting 3
B August 10, 1995 Agency Workshop & Community Meeting 9

III. Attachments

List of Attendees
Written Comments Received
Community Meeting Notices
Meeting Handouts
Sign-In Sheets
Speaker Card

INTRODUCTION

I. INTRODUCTION

A. Study Background and Overview

As part of the San Francisco Watershed Management Planning effort, the San Francisco Water Department (SFWD) conducted the Sunol Valley Resources Management Element (SVRME). The SVRME addressed management of water resources, gravel mineral resources, SFWD facilities, cultural, agricultural, and economic resources, recreation and park facilities, and fisheries in the Alameda Creek corridor within the SFWD Alameda Watershed lands.

On January 26, 1995, the San Francisco Public Utilities Commission (SFPUC) passed a resolution approving the Watershed Management Preferred Alternative. Based upon this Preferred Alternative, Draft Watershed Management Plans and Environmental Impact Reports (EIRs) are being developed for both the Alameda and Peninsula Watersheds. The Watershed Management Plans will provide detailed goals, policies, and actions for SFWD operations and maintenance activities, as well as public access and revenue generation activities on the watersheds. The EIRs will analyze the environmental impact of these actions.

The findings of the SVRME, similar to the findings of the Fire Management Plan and Grazing Plan, will be incorporated into the Alameda Watershed Management Plan and analyzed in the Alameda Watershed Management Plan EIR.

Two rounds of public and agency meetings were held in June and August 1995 to receive public input on proposed alternatives for the SVRME. SFPUC hearings were held in Spring 1996 and a preferred alternative was approved on ______, 1996.

B. Report on the Agency Workshops and Community Meetings

The first Agency Workshop and Community Meeting was held on June 29, 1995 to provide information and receive comments from agencies and stakeholder groups on the goals of the SVRME. The second Agency Workshop and Community Meeting was held on August 10, 1995, to present three conceptual alternatives for discussion with the Sunol community.

Invitation letters were mailed prior to the Agency Workshops to interested agencies, environmental groups, and community organizations. Public notices were mailed prior to the Community Meetings to residents in the Sunol area.

Meeting handouts included a meeting agenda, discussion guide, comment sheet, study schedule, and the executive summary of the Alameda Creek Water Resources Study.

The meetings consisted of a formal presentation followed by a discussion period. Displays included maps and aerial photographs of the proposed study area, study

schedule, resource maps of the Watershed Management Planning process, and boards showing the conceptual alternatives.

C. Report on the Spring 1996 SFPUC Public Meetings

Two SFPUC Public Meetings were held in San Francisco on March 12, 1996, and March 26, 1996, to present the SVRME Alternatives and receive public input. The first meeting was held at the Chambers of the Board of Supervisors and the second meeting was held at the SFPUC hearing room. The SFPUC selected a Preferred Alternative at its regularly scheduled meeting on ________, 1996.

Invitation letters were mailed prior to the meetings to interested agencies, environmental groups, and community organizations. Public notices were mailed to residents in the Sunol area.

The meetings consisted of a presentation to the SFPUC followed by a formal public comment period.

SUMMARY OF COMMENTS

II. SUMMARY OF COMMENTS

A. June 29, 1995 Agency Workshop & Community Meeting

The following is a summary of the verbal and written comments received during the June 29, 1995, Agency Workshop and Community Meeting, or mailed in after the meetings. The summarized comments below are divided, based on the questions from the discussion guide, into four categories:

- General
- Goals of the Study
- Issues South of I-680
- Issues North of I-680

The categories "Issues South of I-680" and "Issues North of I-680" are further divided into the following sub-categories:

- Water Resources
- Gravel Mineral Resources
- SFWD Facilities
- Cultural, Agricultural, and Economic Resources
- Recreation and Park Facilities
- Fisheries

Comments from the Agency Workshop

General

- Clarification of the Preferred Alternative was requested. Is there a Preferred Alternative for the Sunol Valley Resources Management Element?

- Confusion was expressed about the terms "south of I-680" and "north of I-680."

- Clarification was requested of the jurisdictions of respective agencies in Sunol. It was also asked which agency, SFWD or County of Alameda, has the most control over future mining operations.

- The request was made that the study team consider the County of Alameda General Plan sections regarding gravel mineral, economic, recreation and park, cultural, and agricultural resources.

- It was noted that the County of Alameda Planning Department is preparing a Sunol Valley Master Plan which will focus on the agricultural and cultural resources.

- The comment was made that potential impacts from the Calaveras and other seismic faults should be considered in the study.

- It was noted that a public school is located 300 yards away from the proposed mining site.

- The request was made to evaluate potential funding methods.

- The request was made to protect SFWD lands from further development, with a possible exception of agricultural use.

Goals of the Study

- Clarification of the sub-goals was requested.

Issues South of I-680

Water Resources

- Concern was expressed about potential water quality impacts to the Sunol aquifer.

Gravel Mineral Resources

- The timeframe for the mining permits was requested.

- The suggestion was made that additional water supplies gained from reclaiming the used pits should be shared by SFWD with other users.

- It was asked how much more land is available for mining under the existing permits south of I-680. It was also asked if shallower pits can be mined near Calaveras Reservoir.

- A question was asked about the length and extent of the current surface mining permits and leases.

- The comment was made that SFWD as the property owner should have control over the pace and timing of mining operations.

Recreation and Park Facilities

- The request was made that Calaveras Road be recognized as the entry point to the Sunol Regional Park, and that potential visual impacts be addressed. The request was also made for the preservation of a trail corridor.

Fisheries

- Concern was expressed about the proximity of future pits to creek channels.

- It was noted that water is jumping over the banks of Alameda Creek and getting into the pits.

- Concern was expressed about the integrity of the stream channel.

- The request was made for wetland mitigation banking in this area.

- It was stated that streams tend to undercut downstream of extraction sites outside of the active channel.

Issues North of I-680

Water Resources

- It was asked what the impact of expanded quarry operations would be on the Sunol aquifer.

- The comment was made that some of the reclaimed pits may be susceptible to heavy siltation, and not provide very much water storage.

- Concern was expressed about the right-of-way for the South Bay aqueduct. The request was made to protect the stream bed.

- A question was asked about the effect of quarrying on the aqueduct and stream channel.

Gravel Mineral Resources

- Concern was expressed over the depth of new pits.

- The comment was made that the bright lights, noise, and truck traffic caused by the existing mining operations are a nuisance to Sunol residents.

- It was asked if the City and County of San Francisco is obligated to extend quarry leases when they expire. What is best possible use of the land after the mining operations end?

- The request was made for greater setbacks than currently exist for RMC Lodestar from I-680 and Calaveras Road.

SFWD Facilities

- It was asked if there would be any new SFWD facilities associated with using the old pits for water storage.

- A question was asked about the location of the rubber dam.

- It was asked if the South Bay aqueduct could be relocated to provide for a larger quarry.

Cultural, Agricultural, and Economic Resources

- Concern was expressed about the impact of mining activities on agriculture.
- It was noted that the County of Alameda has classified quarrying as agriculture.
- It was stated that mining should not be classified as agriculture.
- It was noted that the County of Alameda will begin a study of agricultural uses within the boundaries of the Sunol school district.
- Concern was expressed about the potential loss of agricultural land.
- The request was made to evaluate the cultural and historic resources, especially the water temple. It was noted that the water temple has both state and national significance.
- The comment was made that the water temple could be used as a public interpretive center and recreational area.
- It was noted that the County of Alameda Parks, Recreation and Historical Commission has an interest in the water temple.

Recreation and Park Facilities

- It was asked if the San Antonio Reservoir or Calaveras Reservoir would allow recreational uses, such as swimming, boating, and fishing. It was also asked if further treatment would be required if recreational uses were allowed on the reservoirs.
- The request was made for bike trails in Niles Canyon.
- It was requested that consideration be given to the County's general plan policy regarding trails on the watershed.
- It was requested that consideration be given to access to regional recreational areas in Sunol.
- It was noted that the Sunol Valley provides access to other resource areas.
- The comment was made that there is a tremendous demand for overnight use in the area. It was stated that approximately 500,000 people per year visit the Shadow Cliffs area.
- The comment was made that recreation in Sunol Valley should be considered separately from the rest of Alameda County. Different types of recreational uses are more in character with Sunol than for the rest of the county.
- It was stated that there is a need for water-based recreation in the Sunol area.

Fisheries

- It was noted that the fisheries contain both cold and warm water fish, except for steelhead.
- Concern was expressed about the management of the fishery in the future.
- It was asked what is the optimal length for a coldwater fishery.

Comments from the Community Meeting

General

- Most of the attendees stated that water storage should be maximized south of I-680, but not expand north of I-680. The freeway should be the barrier for further quarry development.
- A summary of the issues addressed in the lawsuit against the environmental document for the County of Alameda's was requested.
- It was asked if the additional water storage will service all of the SFWD service area, including the growing communities of Milpitas and Hayward. If the customer base continues to increase, then there will be a constant search for additional water storage. The comment was made that a decision needs to be made that creating more water storage is no longer feasible.
- It was stated that an alternative use, such as agricultural or cultural, for land north of I-680 should be developed.
- It was asked if SFWD intends to subdivide and develop the property north of I-680 if mining operations are not expanded.
- It was asked if SFWD shares water with other water districts during droughts.
- It was asked how much effort SFWD makes to educate customers about water conservation devices and techniques.

Goals of the Study

- The comment was made that the amount of water storage that could be gained by expanding quarries can not justify the impacts on Sunol Valley.
- A question was asked about the qualitative aspects of the study process.
- It was stated that it is difficult to compromise with only one major goal.

Water Resources

- The comment was made that the water storage numbers should be carefully reviewed.

- The request was made to define SFWD's service area. What are the growth estimates for the service area and how much additional water storage will be needed to meet the demand?

Gravel Mineral Resources

- It was asked if revenue generation is the purpose of allowing mining on the Alameda Watershed. It was also asked if revenue generating activities are more prevalent now than in the past.

- Concern was expressed about the impact on the quality of life in Sunol from expanded mining operations.

SFWD Facilities

- It was asked if there are impacts to resources resulting from SFWD activity to in the area.

- It was asked what condition SFWD's water treatment and supply system is in.

- The question was asked about where SFWD's overflow water goes.

Cultural, Agricultural, and Economic Resources

- It was noted that one of the provisions of the Preferred Alternative for the San Francisco Watershed Management Plan is to build a visitor center on both the Peninsula and Alameda Watersheds. The water temple would be an ideal location for the visitor center because it serves as an entry point into the tri-valley area. Suggestions for the visitor center included educational displays and classes about endangered species in the area, a ranger station, and recreational facilities.

- The statement was made that Sunol is a gateway to the growing wine region in Livermore Valley, and that information about the wineries in the area should be included at the visitor center.

- The request was made to restore the water temple.

- It was stated that other uses could co-exist with agriculture.

- The request was made for a farmers market selling locally grown produce.

Recreation and Park Facilities

- The request was made for more landscaping in the area.

- Concern was expressed about the types of water recreation allowed. The statement was made that there are too many water parks. It was stated that the Sunol area is more compatible with a more pastoral recreation area.

- The request was made for an aquatic park to the south of I-680. There is a high demand for existing water parks.

- It was stated that the traffic and other problems associated with a regional park like Shadow Cliffs are not wanted in Sunol.

- The request was made for trails and day-use recreational areas.

B. August 10, 1995 Agency Workshop & Community Meeting

The following is a summary of the verbal and written comments received during the August 10, 1995, Agency Workshop and Community Meeting, or mailed in after the meetings.

Agency Workshop

General Questions/Issues

- Has the City issued a mandate for SFWD to generate more revenue by a certain date? How does this influence decision made regarding the SVRMP?

- Provide economic data for proposed recreation uses vs. existing agricultural uses.

- Need more information regarding current reclamation plans for south of I-680.

- Has a random poll of Alameda County residents been conducted to assess desired uses in Sunol?

- It will be a long time before the pits are mined out and restored; what will they look like in the interim?

San Antonio Creek

- Select an alternative that retains San Antonio Creek.

- Do not remove San Antonio Creek.

- If San Antonio Creek was removed, how would it affect SFWD's ability to control reservoir water levels?

Alameda Creek Wildlife Corridor

- It was suggested that the Alameda Creek area be converted to a natural wetlands.
- Restore more wildlife habitat along Alameda Creek and trails.
- It was asked if there were plans to restore a riparian corridor in the vicinity of Alameda Creek in order to maintain a passive wildlife area/corridor.
- Maintain a wildlife corridor along Alameda Creek.
- There is concern that natural areas are interspersed with high use areas both north/west and south/east of I-680 under Alternative A. This does not serve a wildlife purpose; instead, it bisects a wildlife corridor.

SFWD Water Storage/Supply Operations

- The South Bay Aqueduct vicinity should be accessible for repairs in case the area becomes saturated.
- Provide access to the South Bay Aqueduct.
- Examine any and all potential impacts of proposed alternatives on aqueducts and operations
- Will water runoff be diverted to Alameda Creek or recovered and treated?
- Would ponds be available for water storage by other agencies?
- Explore the practicality of proposed uses, particularly the impacts of fluctuating water levels on fishing piers, etc.

Water Quality

- If you draw the creek into a retention pond, consider the impacts.
- There is concern that the reservoirs will not be able to serve as a true emergency water supply due to the intense public/recreation focus; it would have to be boiled prior to use to be on the safe side.

- If there is any possibility that water from these pits would be used for drinking, consult an immunologist.

Geologic Issues

- Seismic concerns were expressed regarding lakes on both sides of the freeway.

- Does the 100-year floodplain affect any of the alternatives? Is there a chance that the entire area could be flooded?

- Alternatives B and C would require removal of large amounts of soil. What would be done with the soil? What is the market for it?

RV Campground

- Relocate the RV campground and the commercial site from the north side of I-680.

- More infrastructure is need for the proposed RV campground.

- There is an intense demand for more recreational campgrounds as well.

Water Recreation Uses

- Use more of the pits now designated for water storage only for swimming, boating and fishing.

- Allow only non-motorized boating on the reservoir.

- Are boating and fishing areas as steep as they look or will slope be altered?

Organic Farm/Farmer's Market

- It was suggested that the proposed organic farm/farmers market may need a subsidy to survive.

- Organic farming will not be profitable; vitaculture is a better prospect.

Staging for Trails

- Provide adequate staging facilities for proposed trails.

- Will the staging and parking area for trails be smaller in Alternative C than in the other alternatives?

- Provide staging/access for trails next to the environmental education center.

Nature/Educational Center

- Since the nature center is located near the creek, will efforts be made to maintain flows through the creek for educational purposes?

- Creek should be evaluated by nature center in its natural state.

- Nature center should focus on interpreting the natural state of the creek, the watershed area, San Francisco operations, etc.

Sunol Temple

- Will the Sunol Water Temple be restored to the same quality as the Pulgas Water Temple in San Mateo? Will public access be free of charge? What activities would be allowed and at what cost?

- Make the restoration of the Sunol Temple a priority.

Alternative Preferences

- Alternative C has fewer impacts than Alternative A.

- Alternative A activities/impacts are dispersed both north and south of I-680.

- Alternative C provides for maximum water storage; Alternative A poses water quality concerns due to proposed high public use.

- Select Alternative A, except for the RV campground north of I-680; relocate it.

- Alternative A is the least intrusive to Sunol; put RV campground on private property rather than on the proposed site which is prime agricultural land; do not select Alternative C; it puts wildlife areas too close to traffic.

- Select Alternative A; it keeps natural areas in tact, has smaller pits and puts passive activities near Sunol.

- Select Alternative A; restore riparian vegetation along Alameda Creek; swimming lagoon near South Bay Aqueduct.

- Select a hybrid of Alternative A/B to get maximum water storage on south side of freeway (Alternative B) and maintain natural values (Alternative A).

- Select Alternative B.
- Select Alternative B, except for the location of the RV campground near the freeway; this is prime agricultural land and should be used as such.

- Select Alternative C without boating.

Community Meeting

Related Proposals

- A representative of the Wetland Habitat Botanical Society, a non-profit organization, proposed a plan for the 69-acres currently leased to Mission Valley Rock; a wetlands botanical garden to restore the site and provide an interpretive/educational component on freshwater habitats; the facility would require 10-foot excavation and $2 million to construct.

- A dog kennel operator presented his need to relocate his dog kennel; asked if there was any available land in Sunol; said he was referred to Sunol by the cities of Pleasanton and Hayward.

General Questions/Comments

- Are the same types of uses proposed for the Peninsula Watershed?

- How does Shadowcliffs manage their water resources -- groundwater recharging?

- The comment was made that in most cases, quarry pits are mined and reclaimed before residential development begins; the reverse is happening in Sunol.

- What are the basic assumptions used to generate the alternatives?

- Does SFWD have a conflict between maximizing water storage vs. generating revenue?

- Does SFWD need 50,000 acre feet of storage and revenue from mining and other revenue generating activities? Do the royalties from additional 20,000 acre feet negate the need for revenue generated from the proposed RV campground?
- Revenue must be generated north of I-680.

Nurseries

- Relocate nurseries from the south side to the prime agricultural land on the north side of I-680; keep all mining activity to the south side of the freeway.
- Relocate nurseries to north side of I-680; keep all mining and revenue producing activities to the south side of I-680.
- Nurseries are not considered a permanent use; make sure more long-lasting yet desirable uses are implemented north of the freeway to prevent future encroachment of undesirable uses.

Aquaculture

- Can the aquaculture water source be moved to south of I-680?
- What are the potential impacts of aquaculture?

Various Proposed Uses

- The following proposed activities were cited as being contradictory to the character of Sunol: quarrying north of the freeway, as well as the commercial site, water slide, RV campground.
- The commercial site is in a dangerous location.
- An organic farm is a good idea; it has been very successful elsewhere.
- How will the trails proposed under Alternative A go under the freeway?
- Provide for bicycle trails.
- There is support for the proposed 10-foot deep botanical wetlands.

RV Campground

- What are the proposed size (acres and spaces) of the proposed RV campground? Restrict number of spaces and length of stay. Expect seasonal use.
- Is it possible to build a separate off-ramp for the RV campground? (Paloma Road is narrow and traffic moves very quickly; dangerous for RV's.)
- The need for an RV campground was questioned.
- Move RV campground to south of the freeway; put proposed botanical wetlands in current RV campground site.

- An RV campground does not have to look like a parking lot. There is a large demand for RV campgrounds in the Bay Area; it is a seasonal business and users are generally responsible.

- Move the RV campground south of the freeway along Calaveras Road or adjacent to the SFWD facilities; limit visits to campground.

- Are there other RV campground locations in the study area?

Quarrying

- Most important element of the alternatives presented is no mining north of I-680; proposed wetlands botanical garden is an acceptable replacement for the 69-acre mining lease.

- No quarrying north of I-680.

- Are current mining operations being monitored?

- In Pleasanton, there are restrictions on gravel trucks along Stanley Boulevard. The expense of transporting gravel from Pleasanton places more of a demand regarding quarrying on Sunol. Have the impacts of transporting gravel from pits been considered?

69-Acre Lease

- Can the 69-acre lease be renegotiated for a use other than the Mission Valley Rock mining lease?

- Can the 69-acre lease be moved to south of I-680?

- If 69-acre lease is mined first and quickly, it would assure the Sunol community that it would be reclaimed soon and preserve the natural vista vs. the proposed RV campground.

Impacts

- What are the potential impacts of pesticides used in conjunction with some of the proposed activities on the water supply?

- What is the impact of using different side slopes on water storage and revenue?

Mitigation/Phasing of Amenities

- Apply mitigation measures proposed in Alternative C to north of I-680.
- Can many of the mitigations and amenities proposed be phased and implemented before mining activities are initiated?

- Are proposed activities contingent upon completion of mining?

- Photos show water level at the top of the pits. Can pits be reclaimed sequentially or will they have to wait until all mining is completed?
- Can some amenities like nurseries be phased for implementation before mining activity begins?
- The design/architecture of the proposed activities should be consistent with the rural character of the Sunol community.
- If Alternative B is selected, how can Sunol residents be assured that it will be implemented as it is presented?
- Is it possible to secure a land trust or dedication agreement in order to protect the land north of the freeway in perpetuity.

Water Operations/Quality

- What is the potential impact of the alternatives on creek flows? Will the pits be filled by Alameda Creek?
- What would the schedule be for drawing down the reservoir water levels: would they fluctuate annually?
- What are the water quality impacts of the proposed recreation and agricultural uses on the creeks, groundwater, etc.
- Is there a need for water storage?
- Why is there a need for additional storage?
- Couldn't Calaveras Reservoir be mined deeper to provide more water storage?
- Retain San Antonio Creek.

Alternative Preferences

- Select any alternative that keeps quarrying south of the freeway.
- Select Alternative A/B hybrid; the north side of B and the south side of A.
- Select Alternative B if 69-acre lease can be renegotiated; if not, select Alternative A.
- Select Alternative B; no quarrying north of I-680.
- Select Alternative B; move nurseries on south side to currently proposed RV campground site.

- Alternative B is preferred; no quarrying north of I-680; minimizes impacts of development; Alternative C is the most impacting because of the commercial activity, the RV campground.

- Select Alternative B.

- Select Alternative B; the organic farming and nature/ educational center is consistent with the character of Sunol.

- Select Alternative B, except for RV campground which is incongruous with the Sunol area.

- 23 of 27 attendees voted in favor of Alternative B (with modifications).

- 1 of 27 attendees voted for Alternative A (with modifications).

ATTACHMENTS

Sunol Valley Resources Management Plan

PLEASE PRINT **Date:** 6/29/95 **Location:** Pleasanton Middle School Library **Event:** Agency Workshop

Name	Address/City/State	Zipcode	Affiliation (Optional)	Did You Receive A Notice In The Mail?
Judy L Bloom	75 Hawthorne W-6-3 San Fran, CA	94105-3901	USEPA	yes
PETER FREY	111 GRAND AVE 14th FLOOR OAKLAND CA 94623	94623	CALTRANS	YES
Michael Finn	2151 Berkeley Way Room 458 Berkeley 94704	94704	DOHS	Yes
Lisa Paterson	Rt 1 Box 39 Byron, CA 94514	94514	DWR	yes
MAXINE TERNER	EBRPD, OAKLAND			yes
Jim Koopman	SFWD			yes
Marya Robbins	Alameda Co RCD 1560 Catalina Ct. Livermore, Ca	94550	ACRCD	yes
JOHN Ummel	BAY AREA WATER USERS 1875 S. GRANT SAN MATEO	94402	BAWUA	Yes
RICHARD BRANDT	1155 MARKET ST. S.F. 94127	94127	SFWD	No
Liz McElligott	224 W. Winton Ave., Rm 151 Hayward, CA 94544	94544	Alameda County	yes
Pat Stillman	Box 500 SUNOL CA 94586	94586	S.O.S. Pres.	Yes, from the

Sunol Valley Resources Management Plan

PLEASE PRINT **Date:** June 29, 1995 **Location:** Pleasanton Middle School - Library **Event:** Agency Wkshp

Name	Address/City/State	Zipcode	Affiliation (Optional)	Did You Receive A Notice In The Mail?
ARIO YSIT	2221 Kilkare Rd. Sunol	94586	ALAMEDA COUNTY PLANNING COMMISSION	YES
Jim Reynolds	Alameda County Water District P.O. Box 5110 / Fremont, CA	94537)	ACWD	NO
LEASA CLELAND	" "	" "	ACWD	Yes
Josh Milstein	City Atty's Ofc 1390 Market ste. 250 SF 94102		SF City Atty	NO
Liz Varnhagen	Corps of Engineers 211 Main St SF 94105 Regulatory Branch	94105		Yes
Michael Bowen	CalTrout 870 Market St 559 San Francisco, CA 941	94102	CalTrout	Y
Ralph Dahlke	Caltrout ↑	94102	Caltrout	Y

Sunol Valley Resources Management Plan

PLEASE PRINT **Date:** 8/10/95 **Location:** Pleasanton Middle School **Event:** Public Meeting

Name	Address/City/State/Tel. #	Zipcode	Affiliation (Optional)	Did You Receive A Notice In The Mail?
Stephen Loftsgaard	3323 Utica St Hayward 94544	94544	Eden Pet	No
BILL & Marlene Rebello	10579 Foothill Rd Sunol ~~945~~	94586	S.O.S.	yes
Jim O'Laughlin	199 Bond St Sunol 94586	94586		Yes
BART Stillman	2934 Kilkare Rd SUNOL 94586		SO S	yes
KAT SILBERMANN	P.O. BOX 344 SUNOL CA. ~~94586~~	94586	S.O.S.	YES.
GENE KACZMAREK	PO BOX 7263 FREMONT CA ~~94537~~	94537	MISSION PEAK FLY ANGLERS	YES.
Diane Heckman	POB 40 Sunol CA ~~94~~	94586	SOS	yes
Joe Scalmanini	520 First St. Woodland CA 95695		LSCE	yes
JEROME ENGELBERTS	12062 A KNOBHILL TRAIL SUNOL 94586	94586	SOS	YES-
SHIRLEY KAMINSKI	P.O. BOX 565 SUNOL, 94586	94586	SOS	yes
BARRY KAMINSKI	"	"	"	"
Lowell Hamilton	607 Kilkare Rd Sunol CA 94586	94586	SOS	yes

Sunol Valley Resources Management Plan

PLEASE PRINT **Date:** 8/10/95 **Location:** Pleasanton Middle School **Event:** Public Meeting

Name	Address/City/State/Tel. #	Zipcode	Affiliation (Optional)	Did You Receive A Notice In The Mail?
Bree Jamigo	1014 Kilkare Rd	94586	S.O.S.	Yes.
Maryanne Vinagro	861 Kilkare Rd	94586	SOS	

Sunol Valley Resources Management Plan

PLEASE PRINT **Date:** 8/10/95 **Location:** Pleasanton Middle School **Event:** Public Meeting

Name	Address/City/State/Tel. #	Zipcode	Affiliation (Optional)	Did You Receive A Notice In The Mail?
Kendall Guthrie	12034 Glenora Wy Sunol 862-0820	94586		✓
Eric Honea	12034 Glenora Way Sunol	94586		✓
NEIL DAVIES	2824 Kilkare Rd. "	"	SCN	Y ~~es~~
Pat Sheltman	2934 Kilkare		SoOS	
Tom Pico	745 Neal Pl Pleasanton	94566	Pleasanton Councilmember	
Mort Calvert	7499 Athenour	94586	Sunol	N
STEPHEN T WOLSK	PO BOX 5115-312 FREMONT CA 92	94537	WETLAND HABITAT BOTANICAL SOCIETY	No
BOB FOSTER	12058 GLENORA WAY SUNOL	94586	SOS	yes
GRAHAM BARNES	1415 KILKARE ROAD	94586		Yes,
Kimberly Smith	3 Jackson St SF	94111	Hms Assoc	Yes

Sunol Valley Resources Management Plan

PLEASE PRINT Date: 8/10/95 Location: Pleasanton Middle School Event: Public Meeting

Name	Address/City/State/Tel. #	Zipcode	Affiliation (Optional)	Did You Receive A Notice In The Mail?
Greg Davis	12083 Ruth Glen Sunol	94586	SOS	yes
Gary Chambers	12074 Ruth Glen, Sunol 862-0729	94586		NO
Terry Grimmer	2209 Kilkare Rd Sunol 862-2209	94586	SOS	No
Michael Freemire	770 Kilkare Rd Sunol 862 9018	94586	SOS	yes
Hans Peeters	1050 Kilkare 8622102	"		yes
JERRY SNYDER	4060 FAIRWOOD ST	94538	MISSION PEAK FLY ANGLERS	YES
Conover Smith	2866 KILKARE RD., Sunol	94586	self	yes
James Sorensen	399 Elmhurst St, Hay	94544	Ala. Co.	yes
Cl Bob FRILLMAN	9911 Foothill Rd Sunol	94586	IRP Co	Y
CINDY FRILLMAN	"	"	"	"

Sunol Valley Resources Management Plan

PLEASE PRINT Date: 3/12/96 Location: Board of Supervisors Chambers Event: SFPUC Public Mtg.

Name	Address/City/State/Tel. #	Zipcode	Affiliation (Optional)	Did You Receive A Notice In The Mail?
IRVIN TIESSEN	2864 KilKARE Rd	94586	SOS.	✓
Diane Tiessen	" " " 862-2020	"	"	✓
Pat Stillman	862-2263 2934 KilKare, Sunol	94586	S.O.S	✓
BARTON Stillman	862-2263 2934 Kilkare Rd, SUNOL	94586	SOS	✓
HOWARD HAMBURG	407 Montford AVE Mill Valley Ca.	94941	REC	NO
Jocelyn Conlin	5157 Greentree Ct Pleasanton	94566	EBRPD	YES
Belinda Griswold	520 Hampshire SF	94110	SF Bay Guardian	yes
MIKE CERNY	3540 Andrade Rd Sunol	94586	Hi C Nursery	NO.
Pete Cottes	P.O. Box 5252 Pleasanton	94566	RMC LONESTAR	YES
Margaret Roper	P.O. Box 1723; Gilroy 95021 →		CDFG	Yes
MORT CALVERT	7999 Athenour Way	94586	Mission Valley Rock	No
RICK NELSON				

Sunol Valley Resources Management Plan

PLEASE PRINT Date: 3/12/96 Location: Board of Supervisors Chambers Event: SF PUC Mtg.

Name	Address/City/State/Tel. #	Zipcode	Affiliation (Optional)	Did You Receive A Notice In The Mail?
Adolph Martinelli	Alameda County Planning 399 Elmhurst St - Hayw			
Nancy Davis	12083 Ruth Glen Sunol	94586	SOS, S.	Yes
CINDY FRILLMAN	9911 Foothill Rd SUNOL	94586	—	Yes

Sunol Valley Resources Management Plan

PLEASE PRINT **Date:** 3/12/96 **Location:** Board of Supervisors Chambers **Event:** SFPUC Public Meeting

Name	Address/City/State/Tel. #	Zipcode	Affiliation (Optional)	Did You Receive A Notice In The Mail?
MARYANNE CAMAPARO	862-2054 861 Kilkare Rd Sunol CA	94586		
Frank Rollo	555 M			
William Howard	MUR			
Bob Soria	7999 Athenoue Sunol	94586	MWR	
ARIO-YSIT	2221 KILKARE Sunol	94586	Planning Comm Alameda Coun	X
Richard [illegible]	3145 Kilgore Rd R.C.	95670	RMC Lonestar -	
Jim Van Nest	4750-A Norris Cyn Rd	San Ramon	CA 94583	RMC LONESTAR
Joanne Dean-Freemire	770 Kilkare Rd. Sunol	94586	Resident	yes
Kimberly Smith	3 JACKSON ST SF	94111		yes
Noreen Ambrose	264 Clipper St. SF	94114	Resident	No

Sunol Valley Resources Management Plan
COMMENT SHEET

Name: Barry+ Shirley Kaminsky Date: 8-10-95

Affiliation: SOS Address: P.O. Box 565

City: Sunol Zipcode: 94586 Phone: 862-2427

We welcome your input as a valuable component of the planning process: (Please Print)

- We support plan B with the exception of the R.V. campground
- R.V use is incongruous with the idea of maintaining an area for an interpretive center, restoration of the H_2O temple, trails, agriculture etc.
- Dislike the idea of H_2O slides ~ No "SHADOWCLIFF" type areas.
- Please send us a copy of the 3 alternative plans when they are available.

THANK YOU!

(use reverse if necessary)

PLEASE PLACE THIS IN THE COMMENT BOX TONIGHT OR MAIL TO:
Ed Stewart, San Francisco Water Department
P.O. Box 730 Millbrae, CA 94030

EBAW
PAM

June 30, 1995

Ed Stewart
San Francisco Water Department
P.O. Box 730
Millbrae, CA 94030

Dear Ed:

My husband and I wish to thank you and your staff for coming to Pleasanton last night, June 29th to update us on SFWD position on the Sunol Valley Resources Plan and to hear our concerns and ideas.

We appreciate the warmth and patience that you all had and the very professional way in which you dealt with some of the more emotional outbreaks by some of our group. Barry and I felt that you listened to everyone and facilitated the meeting in such a way that we were all working together and being more constructive. This has not always been the case! I especially commend you, Cheryl Davis, and Kelly Stewart.

Though Barry and I are usually fairly quiet at public meetings, we too feel very strongly that the proposed Mission Valley Rock Quarry operation is very detrimental to Sunol and that the EIR which has already been done by Alameda County and Mission Valley Rock has NOT been mitigated. We have lived in Sunol for 17 years and three of our children graduated from Sunol Glen. Our hopes are that the same quality will be here for generations to come. We have issues with the agricultural land being used in this way, the possible detrimental affects to Sunol Glen School, with the air and noise quality, with the possible devaluation of our property, and with the changing of the character of Sunol.

We appreciate the maps and schematics you brought with you to the meeting. With those and your descriptions, we have a much clearer picture of existing conditions and proposed changes both north and south of I-680.

We are interested in the north of I-680 property being developed in a way that would preserve the beauty and integrity of this piece of land and make it useable to the general public on a limited basis. I would venture to say that many Sunolians would even contribute time and monies to the restoration of the water temple.

So, we encourage you to look at and adopt alternative ways of procuring adequate water storage, as well as generating income, from the existing quarry sites on the south side of the freeway.

Alternative possibilities we can personally support and be involved in the development of are as follows:

Sunol Valley Resources Management Plan
COMMENT SHEET

Name: Nancy Davis
Date: 8/22/95
Affiliation: Save Our Sunol
Address: 12083 Ruth Glen
City: Sunol
Zipcode: 94586
Phone: (510) 862-0809

We welcome your input as a valuable component of the planning process: (Please Print)

I am very much interested in Plan B. Would you please send maps of all the plans to me. I am so pleased that SFWD wants to work with the citizens directly, and I am sure we can find a solution that will meet all of our needs. Plan B sounds closest to what the residents of Sunol want. I think we simply do not want any quarrying on the Northwest side of the freeway. That Valley would be best served if allowed to represent the beauty of our area, and be the center for cultural places surrounding the Water Temple. Thank you for listening - Please send all maps and current information regarding this issue to: Nancy & Greg Davis
12083 Ruth Glen
Sunol, CA 94586

RECEIVED
AUG 25 1995
SFWD WATERSHED

cc: Ed Stewart
Joe Naras
P.A.M.
EDAW
Orgnl. to file

(use reverse if necessary)

SE PLACE THIS IN THE COMMENT BOX TONIGHT OR MAIL TO:
Ed Stewart, San Francisco Water Department
P.O. Box 730 Millbrae, CA 94030

Sunol Valley Resources Management Plan
COMMENT SHEET

Name Diane Hedman Date: 8/10/95

Affiliation: Address: POB 40

City: Sunol CA Zipcode: 94586 Phone: 408-577-7467w

We welcome your input as a valuable component of the planning process: (Please Print)

In order of importance, my goals are:

1) No quarries north of 680 (on the Sunol side)
2) Restore the water temple
3) Retain the rural quality in the area. The open view of the valley should be preserved.

To be conspiratorial, it seems Plan B has been tailored to appeal to Sunolians. For the benefit of the quarriers, the area that can be quarried has been maximized. Good for them, and we can live with the sacrifice of the south side of 680. SFWD gets to maximize profits on the Sunol side. What seems to be in it for the Sunolians is a restoration of the water temple and a "wildlife area" surrounding Alameda Creek. We'd really rather have a huge organic farm and a restored water temple.

I do appreciate the work you have put into the alternatives and for taking the time to listen to us.

As I said at the meeting, I don't like the RV park. It should be on the south side of the freeway, and have a maximum stay limitation. The commercial site is proposed at a dangerous location and is unnecessary. (use reverse if necessary)

PLEASE PLACE THIS IN THE COMMENT BOX TONIGHT OR MAIL TO:
Ed Stewart, San Francisco Water Department
P.O. Box 730 Millbrae, CA 94030

Sunol Valley Resources Management Plan

COMMENT SHEET

Name GRAHAM BARNES Date: 8-10-95

Affiliation: Address: 1415 KILKARE

City: SUNOL Zipcode: 94586 Phone: (510) 862-0204

We welcome your input as a valuable component of the planning process: (Please Print)

1. It seems that everyone wants a piece of this land
2. The residents are primarily interested in the following:
   (a) no quarry
   (b) minimum impact and development
   (c) retain as much as possible the current pastoral quality of the area
3. Of the 3 options, plan B is preferable: not C however:
4. Many of the ~~options~~ amenities may have significant impact and are less desireable:
   - commercial activity sites
   - RVs - next to the freeway!
   - waterslides
5. Overall, not particularly in favor of a Shadow Cliffs style result which pla A represents.
6. Would like to retain San Antonio Creek
7. Are very concerned that the clean-up operation, trails, etc. will not occur for many years and then may eventually prove to be too expensive
8. The nurseries are not overwhelmingly (use reverse if necessary) scenic if all the plants are located in pots.

PLEASE PLACE THIS IN THE COMMENT BOX TONIGHT OR MAIL TO:
Ed Stewart, San Francisco Water Department
P.O. Box 730 Millbrae, CA 94030

9. Which of these plans overall maximizes [illegible] [illegible]

CC: Ed Stewart
Joe Naras
P.A.M.
EDAW
Orgnl. to file

SAN FRANCISCO, CA
PM
19 AUG
1995

USA 1¢

USA 19

PUC
P.O. Box 730
Millbrae, CA 94030

Attention
Watershed Area

Aug 19, 1995

To the PUC -

Regarding the San Francisco Water Shed area - do not allow any development of golf course or any new trails - We need to keep our open space and any wildlife ~~now~~ as it is.

Please no development.

Thanks.

L Muscio
So San Francisco

cc: Ed Stewart
Joe Naras
P.A.M.
EDAW
Orgnl. to file

NCISCO, CA 941
PM
AUG
1995

USA 1¢

USA 19

PUC
Attn: Water shed area
PO Box 730
Millbrae, CA 94030

© USPS 1991

---

august 19th 1995

PUC.

Concerning the San Francisco Water Shed area, please do not allow, any new tracts or golf Course to be developed. We all have a responsibility and obligation to preserve the few untouched areas we have in our community.

Marisa Musca
So. San Fran. CA 94080

✓cc: PAM

✓cc: Ed, Mark, & Joe

RECEIVED
AUG - 1 1995
SFWD WATERSHED

1736 Valley View
Belmont, CA 94002
July 17, 1994

Ed Stewart, Watershed Manager
San Francisco Water Department
P.O. Box 730
Millbrae, CA 94030

Dear Mr. Stewart:

I keep reading in the newspapers about efforts to promote the use of 160 acres in the San Francisco Watershed for a golf course and to open other parts of the watershed for public use. Even though I am a Peninsula resident who laments the lack of opportunities to get away from crowded trails and traffic noise, I am absolutely opposed to both of those ideas.

Land is scarce here and a golf course would use too much land for recreation for too few people. Golf courses are artificial creations requiring vast amounts of water, and although water seems plentiful this year, it seems clear that we are in for extended periods of drought. I'm willing to conserve water (and pay the higher prices that accompany my efforts), but I'm not willing to do it so that yet another golf course can be kept green. Golf courses also require fertilizers which drain into water tables or streams and eventually other bodies of water and damage the environment. Golf courses displace natural vegetation and animal life.

I can sympathize with people who want more trails opened up in the watershed, but I'm opposed to that, too. Opening up wild, natural areas destroys them, and they are expensive to maintain. Our county parks are in trouble because we can't afford adequate staff. Even if I can't get into the watershed and have to admire it from a distance, I revel in the knowledge that it's there—that in this area we have at least a remnant of wilderness and we are guarding it. I'd like it left that way. Do we have to tromp over every last bit of the earth? I hope not.

Sincerely,

Joline Bettendorf

Joline Bettendorf

cc: San Mateo County Board of Supervisors

EDEN PET CARE CENTER

33421 Mission Blvd., Union City, CA 94587

Date: August 8, 1995
Contact: Steve & Mary Loftsgaard
510/471-0573 or 510/471-7055

EDEN PET CARE CENTER RELOCATION PLANS INCLUDE DEVELOPING A REGIONAL KENNEL

UNION CITY, CA - Steve and Mary Loftsgaard, owners of Eden Kennels, after six increasingly successful years as guardian angels to thousands of domestic and rescued cats and dogs, were forced to leave their popular location in Union City in June 1993 due to commercial development of the land. The Eden property had been leased from an owner who defaulted to a thrift company. After losing their long, hard battle to purchase the land, rather than relocate, they moved all of the animals to safety, and started an intensive search for a new Eden Kennel site.

Their lifelong love of animals, plus the knowledge they gained in the Bay Area animal world during those years of operating Eden Kennels, made them well aware of the lack of adequate care facilities for pets and rescue animals, as well as the overwhelming need for solving the overpopulation problem. It had long been the Loftsgaards' dream to develop a complete pet care community and make that dream a reality. Others who also shared that dream came forward and became involved by contributing their ideas and sharing their expertise -- legal advisors, financial advisors, and real estate advisors.

One of the Loftsgaards' main goals for this entire development is to provide land for construction of a large rescue facility as follows:

NON-PROFIT ANIMAL SHELTER - The plan is to set aside one acre of land to be offered for a nominal $1.00 a year lease with options to renew to a non-profit organization or group of non-profit organizations on which they may build a rescue shelter. Certain proceeds from the other income-producing facilities in the pet care complex, upon agreement of all parties, will also help to defray rescue costs.

RETAIL PET SUPPLY AND PET FOOD STORE - Aggressive marketing is planned to attract Eden's existing and recaptured 4500 customer base plus adding new customers due to their new location and the overall added attraction of the entire pet care center. Consideration is being given to work out a plan to provide pet food to rescuers at an attractive discount to facilitate their continued rescue activities.

PET MEMORIAL WALL, WALKING PATH AND GARDEN - This magnificent, beautifully landscaped project will include meditation alcoves, a small chapel for memorial services for bereaved animal lovers and the beloved pets they have lost. Portions of the proceeds from this Pet Memorial Wall could be donated to the rescue shelter or to help subsidize the spay and neuter program. An annual or semi-

annual Blessing of the Animals ceremony would be just one of many special activities.

ANIMAL PARK AND DOG WALKING TRAILS - This has the potential of bringing in additional income by charging an entrance and use fee to help defray landscaping and maintenance costs.

FUTURE DEVELOPMENT - Full service pet cemetery could be developed in the future depending on land availability. The nearest one is currently in Napa, and is reaching full capacity.

A PICK UP AND DELIVERY SERVICE - For people vacationing in other countries, moving out of state or just across town we will board your animal until you're settled in your new surroundings. We will also deliver, fly, or ship your animal right to your front door.

We have reestablished, maintained and operated under Eden Pet Care at 33421 Mission Blvd. in Union City for more than a year and are doing well, we are also operating our pick up and delivery service to our customers and this is also doing well.

Comprehensive population projections, median incomes, competitive market survey figures and average pets per household have been studied and detailed figures are to be included in Eden Kennels formal business plan along with other required documentation. This study, which has proven the need for a large, full-service, high-quality kennel where concern for the animals is foremost, has revealed that there are only four other full service kennels in the entire Southern Alameda and Contra Costa county area who have the reputation, full services and high standards to rate with the best. This is a totally inadequate number to serve an area which has grown over 200% since 1980.

As for the future of kennels in general, in a January, 1992 letter from the American Boarding Kennel Association states, "census figures show that the demographic group that spends the most per household on their pets (45-54 of age, married, with before-tax incomes of $50,000) will increase almost 50% by the end of the decade.... Also that "pet-related product and service providers will have a strategically wonderful position for probably the next 20 years".

In 1987, Steve and Mary "rescued" the old Greenbriar Kennel after the business had gone into a total decline. This state-of-the-art kennel had been built to provide the best for animal comfort as well as sanitation at a cost of $250,000, but because the business had run down to the point of little or no income, the land had been sold and the owners were retiring. Five dogs had been left abandoned by their owners. The Loftsgaards are strongly opposed to killing unwanted healthy animals, so with their tender loving care, they soon were able to place the dogs in good homes with loving owners. That first year, Steve and Mary grossed only $36,000, with no net profit, but their philosophy of caring for each animal as if caring for a friend's child quickly made their kennel very popular.

The Loftgaards' strongly believe that animals who are otherwise considered unadoptable, when cleaned up, spayed or neutered, and brought back to health, readily can be placed in good

homes with kind, loving people who would bring them back for grooming and boarding, possibly even training. The Loftsgaards' compassion for all living creatures has laid the foundation for what grew into a thriving, profitable business in just a few short years. All this was done at considerable financial cost to the Loftsgaards in the earliest years when many people who left animal at the kennel for long term boarding abandoned them there. New policies were established to prevent this by asking for boarding fees in advance, and new, aggressive adoption efforts were put in place for those that had been abandoned. By expanding and modifying grooming rooms, the grooming business increased. After massive cleaning and sprucing up of the former kennels and grounds, Steve and Mary were able to allow pet owners into the kennel area at any time to assure them that their pet were being given the best of care in a clean facility.

Their first year's gross income of $36,000 grew consistently through 1992 to $192,000. Their net profit peaked at 23.8% in 1989, and although their gross income in 1992 showed a 52.7% jump due to their public popularity, their net profit was only 20.6% due to extremely high litigation costs in that year to try to save the kennel location.

The 1993 American Boarding Kennel Boarding and Grooming Survey for medium to large kennels with 59 to 100+ runs report an average gross income of $217,300 to $333,064. If Eden Kennels had been in full operation for all of 1993, the Loftsgaards' had forecasted a conservative projection of $260,000 based on the ABA industry average as well as Eden's average growth ratio of the last six years. Note, however, that Eden was forced to close its Union City location on June 15, 1993 due to commercial development of the land. The $260,000 figure, therefore, is now projected for l995 with strong potential for even greater growth due to the addition of the other income producing activities, including, but not limited to, the expansion of the kennels themselves, retail store, vet clinic, grooming school, and memorial wall.

Actual income in 1993 for the slow months of the year from January to June 15, was $76,679.33. During that time, however, due to the legal proceedings brought about in trying to keep from moving Eden Kennels, Mary and Steve had to turn away customers because they could not schedule boarding dates in advance due to the uncertainty surrounding the legal situation.

The long legal battle Steve and Mary were forced to endure destroyed their savings, but not their spirit. They continue to fight the battle for survival of Eden Kennels - a battle which can only be won by calling on compassionate people whose love of animals and concern for the human community is a common bond and who share a sense of commitment, dedication and determination to do what is right to protect the rights of animals. There is a place for everyone in this endeavor, but none of it can be done without financing. The many achievements of Steve, Mary and their Eden Kennels in just the few short years proved they have learned their business well. Their dream of helping the animals is destined for great success if other like-minded animal lovers will jump on this "Pet Care Express", crank up the steam and bring it into our community on schedule.

Knowing their clients' loyalties, the Loftgaards fully expect to retain or recapture nearly 100% of their 4500 customer base, plus gain additional new customers as the result of word of mouth recommendations, aggressive promotional campaigns and advertising, a well as the additional publicity for the new pet care center, from which everyone will benefit. The former kennel loca-

tion had only 60 runs, plans are to phase in 60 additional dog runs and an enlarged cattery in the new location as quickly as possible, which will greatly increase revenues.

The holidays, of course, are one of the two peak seasons of the year, the other being the summer months which have just passed. Steve and Mary are extremely eager to get back into at least a minimal operation before Thanksgiving or Christmas, and be prepared to aid rescuers as always by making their kennel facilities completely available for Adopt-a-Pet month in January, February and March, traditionally their slowest business months. It is a time honored practice among reputable rescuers not to adopt out animals as gifts at Christmas time because too often these are impulse gifts and the pets are returned. Also, introducing a pet to a home during the excitement of the Holidays is stressful for the animal. Therefore there are many adoptees still waiting for homes after Christmas.

There is much more to the story, not the least of which is Steve and Mary's animal love stories, as well as their own. How they met, working together so well that they married shortly after relocating Eden Kennels to Union City from Eden Canyon Road, their original location. They continued building the kennel business with the assistance of their two talented, resourceful children, Joey Francis Morey, IV, who at 13 is an avid football player and dog lover, and Marissa Lee Morey, a delightful young lady of 15, who is an excellent cook and lover of cats and small dogs. But, that's all another story!!!

Because of Steve and Mary's shared compassion for animals, they are willing to sacrifice and share the proceeds of their business to provide the best future possible for these helpless, precious pets and homeless animals. They are looking for like-minded animal lovers who are willing to help them make this possible.

The flexibility of the Loftsgaards' development plan provides opportunities for direct as well as indirect participation in many forms. Steve and Mary will consider all offers of assistance and/or participation in any form and at all levels. A project of this magnitude requires, but is not limited to, either land, additional cash investments, consideration of a limited partnership, letters of credit, co-signatures or "whatever it takes to it happen."

For more information, lease call Steve or Mary Loftsgaard at 510/471-0573 or 510/471-7055 or their designated contact, Wanda McDermott, at 4O8/374-7672 (FAX # 4O8/866-I973)

Sunol Valley Resources Management Plan
COMMENT SHEET

Name: Jim O'Laughlin

Date: 8-10-95

Affiliation:

Address: P.O. Box 400

City: Sunol

Zipcode: 94586

Phone: 862-2550

We welcome your input as a valuable component of the planning process: (Please Print)

PlEASE SEND plans of AlTERNATIVES.

(use reverse if necessary)

PLEASE PLACE THIS IN THE COMMENT BOX TONIGHT OR MAIL TO:
Ed Stewart, San Francisco Water Department
P.O. Box 730 Millbrae, CA 94030

Sunol Valley Resources Management Plan

COMMENT SHEET

Name: Lisa Paterson

Date: 8/22/95

Affiliation: Department of Water Resource

Address: Rt 1 Box 39

City: Byron, CA

Zipcode: 94514

Phone: 209 833 2101

We welcome your input as a valuable component of the planning process: (Please Print)

I am interested in obtaining a copy of any maps or written material pertaining to the alternative plans presented in the August 10th agency workshop.

RECEIVE
AUG 22
SFWD W

CC: Ed Stewart
Joe Naras
P.A.M.
EDAW
Orgnl. to file

(use reverse if necessary)

PLEASE PLACE THIS IN THE COMMENT BOX TONIGHT OR MAIL TO:
Ed Stewart, San Francisco Water Department
P.O. Box 730 Millbrae, CA 94030

Sunol Valley Resources Management Plan
COMMENT SHEET

Name BOB FOSTER
Date: Aug 10
Affiliation:
Address: 12058 Glenora Wa
City: Sunol
Zipcode: 94586
Phone: 862-2949

We welcome your input as a valuable component of the planning process: (Please Print)

Thanks for caring enough to do a good job in generating well thought out alternatives -

Please send to me, the "small" version of the alternatives.

Thanks

(use reverse if necessary)

PLEASE PLACE THIS IN THE COMMENT BOX TONIGHT OR MAIL TO:
Ed Stewart, San Francisco Water Department
P.O. Box 730 Millbrae, CA 94030

Sunol Valley Resources Management Plan

COMMENT SHEET

Name MaryAnne Lanzaro

Date: 8/10/95

Affiliation: SOS

Address: 861 Kilkare Rd

City: Sunol CA

Zipcode: 94586

Phone: 862-2054

We welcome your input as a valuable component of the planning process: (Please Print)

I support Plan B —

Would like copy of the three alternatives —

thanks —

(use reverse if necessary)

PLEASE PLACE THIS IN THE COMMENT BOX TONIGHT OR MAIL TO:

Ed Stewart, San Francisco Water Department

P.O. Box 730 Millbrae, CA 94030

Sunol Valley Resources Management Plan
COMMENT SHEET

Name James Sorensen Date: 8/10/95

Affiliation: Alameda County Planning Dept. Address: 399 Elmhurst St.

City: Hayward, CA Zipcode: 94544 Phone: 510- 670-5400

We welcome your input as a valuable component of the planning process: (Please Print)

Once we get the plans, we'll prepare some comments for your consideration. Preliminarily I'd say a combination alternative should be evaluated – namely the concept south of the freeway under Alternative A (with some water storage increases as well) plus the concept north of the freeway under Alternative C. Storage capacity? Recreational/other land use opportunities? Timing for reclamation?

In any of the alternatives, what are the opportunities and advantages of coordinating SF's pits with private quarries on the periphery?

Also, another alternative could be:
- concept north of the freeway under Alt. A. plus
- concept south of the freeway under Alt.'s B or C.

(use reverse if necessary)

PLEASE PLACE THIS IN THE COMMENT BOX TONIGHT OR MAIL TO:
Ed Stewart, San Francisco Water Department
P.O. Box 730 Millbrae, CA 94030

Sunol Valley Resources Management Plan
Agency Workshop Agenda

Pleasanton Middle School Library
Thursday, August 10, 1995 ● 2:00 pm - 4:00 pm

5 min.	❶ **Welcome and Introductions**	*Cheryl Davis, Division Manager, Water Supply and Treatment Division, SFWD*
5 min.	❷ **Meeting Purpose and Format**	*Kelly Stewart, Public Affairs Management*
10 min.	❸ **Overview of the Plan**	*Ed Stewart, Watershed Manager, SFWD*
35 min.	❹ **Presentation of Conceptual Alternatives** ➲ Alternative 1 ➲ Alternative 2 ➲ Alternative 3	*Tina Stott, EDAW*
60 min.	❺ **Discussion Period**	*Staff and Participants*
5 min.	❻ **Next Steps/Conclusion**	*Ed Stewart*

San Francisco Watershed Management Plans

Sunol Valley Resources Management Plan

San Francisco Public Utilities Commission Meeting

Chambers of the Board of Supervisors
March 12, 1996 ● 7:00 pm

Project Overview

Purpose

As part of the San Francisco Watershed Management Planning effort, the San Francisco Water Department (SFWD) has prepared a Sunol Valley Resources Management Plan (SVRMP). The purpose of the SVRMP is to provide a comprehensive overview of the multiple resources in the Sunol Valley and propose an integrated approach to their management. Sunol Valley resources include: water resources, gravel resources, San Francisco Water Department facilities, cultural resources, agricultural resources, economic resources, recreation and park facilities and fisheries in the Alameda Creek corridor within the SFWD Alameda Watershed lands.

Process

The SVRMP process was initiated in Summer 1995. Two public workshops and two agency workshops have been held to date. The first public workshop and agency workshop was held on June 29, 1995, and the second public workshop and agency workshop on August 10, 1995. Both sets of workshops were held in Pleasanton. At the first workshops, meeting attendees were asked to provide their comments on the planning for the Sunol Valley. Comments were recorded and addressed in the development of the alternative plans (A, B, and C), which were presented for public comment at the second set of workshops. Following these workshops, a fourth alternative, the Preferred Alternative (now titled Alternative D) was prepared which reflected a balance among SFWD, agency and community concerns.

Since that time, two additional alternatives (E and F) have been prepared. Alternative E was prepared in response to comments received from the Alameda County Planning Department and Mission Valley Rock, and reflects SMP-32, the Surface Mining Permit approved by Alameda County and held by Mission Valley Rock for the area north of I-680. South of I-680, Alternative E reflects existing mining permits. Alternative F requires a greater setback to the mining area from the Sunol Water Temple north of I-680. This provides a larger archeological/interpretive area than was permitted in SMP-32. South of I-680, Alternative F maximizes mining extent and depth to achieve maximum future water storage capacity and would require amendments to existing mining permits.

These six alternatives will be considered today by the San Francisco Public Utilitites Commission (SFPUC). All alternatives will be presented and open to comment. A preferred alternative has not been put forward for approval. The SFPUC will identify an alternative to be incorporated into the Alameda Watershed Management Plan and analyzed in the Alameda Watershed Management Plan EIR during the SFPUC meeting on March 26, 1996, beginning at 1:00 p.m. Public scoping meetings for the Watershed Management Plan EIRs will be held in June 1996.

San Francisco Watershed Management Plans
Sunol Valley Resources Management Plan

San Francisco Public Utilities Commission Meeting

Chambers of the Board of Supervisors
March 12, 1996 ● 7:00 pm

AGENDA

❶ Welcome and Introductions
Marion Otsea, President, San Francisco Public Utilities Commission
Andy Moran, General Manager, San Francisco Public Utilities Commission

❷ Sunol Valley Resources Management Plan Background and Overview
Ed Stewart, Watershed Manager, San Francisco Water Department

❸ Sunol Valley Resources Management Plan Alternatives Description
David Blau, EDAW

❹ Invited Speakers

❺ Public Comment

Sunol Valley Resources Management Plan

PLEASE PRINT Date:________ Location:________ Event:________

Name	Address/City/State/Tel. #	Zipcode	Affiliation (Optional)	Did You Receive A Notice In The Mail?

SPEAKER CARD

Sunol Valley Resource Management Plan
Sunol Community Meeting
August 10, 1995

Name:______________________________

Organization:______________________________

City:______________________________

SPEAKER CARD

Sunol Valley Resource Management Plan
Sunol Community Meeting
August 10, 1995

Name:______________________________

Organization:______________________________

City:______________________________

SPEAKER CARD

Sunol Valley Resource Management Plan
Sunol Community Meeting
August 10, 1995

Name:______________________________

Organization:______________________________

City:______________________________

SPEAKER CARD

Sunol Valley Resource Management Plan
Sunol Community Meeting
August 10, 1995

Name:______________________________

Organization:______________________________

City:______________________________

2